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THE RUBIACEAE OF BOLIVIA

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The present paper is the third of a series that treats of the Rubiaceae of various South American countries. The first, devoted to the Rubiaceae of Colombia, listed 80 genera and 443 species; the second, which dealt with the family as it is represented in Ecuador, enumerated 45 genera and 178 species. The number reported from Bolivia is much smaller than that from Colombia. The reduced number is, in part, a result of less intensive or extensive exploration, but it is influenced more largely, perhaps, by the fact that Bolivia lies at the southwestern extremity of the principal area of dispersal of the American Rubiaceae. Much of Bolivia is of so great an elevation that only a few temperate genera, such as *Galium*, *Relbunium*, and *Arcytophyllum*, are represented. Most Rubiaceae are tropical, and it is only on the eastern slopes of the Bolivian Andes that species of the tropical genera are found. This portion of the country is a wild and sparsely populated region that has been explored botanically only in comparatively small part.

So far as the North American botanical expeditions to Bolivia are concerned, they seem to have yielded but meager returns for the effort and expense invested, but the work of resident botanists or collectors has been more successful.

In the preparation of the present paper there has been available but little material from the collections of the early workers in the region, such as Mandon and Pearce. The two visits made to the country by Dr. H. H. Rusby have yielded a substantial amount of interesting material of the Rubiaceae, but much richer are the collections made by Miguel Bang, which were distributed to most of the larger herbaria of America and Europe. Dr. Rusby published catalogues of his own collections and those of Bang, besides an account of those of the more recent Mulford Expedition, and he has named a large proportion of the apparently endemic Bolivian Rubiaceae.

Substantial collections of Bolivian plants have been made by K. Fiebrig and Dr. Th. Herzog during visits to the country. The most extensive and important collection of the flora of Bolivia is that made

in late years by Dr. Otto Buchtien, a resident in the country. His admirably prepared specimens represent not only most of the species discovered by earlier collectors, but a host of new ones. His collections have been distributed widely. They are well represented at Berlin, and his own herbarium, containing presumably the largest representation of his plants, although not a complete one, was purchased a few years ago by the United States National Museum.

Another collector whose explorations have contributed materially to the knowledge of the Bolivian flora is José Steinbach. Most of his plants have been collected in the Department of Santa Cruz, and, as the following pages will prove, they afford numerous additions to the Rubiaceae.

In the preparation of this enumeration the writer has been able to examine a large number of specimens of the family from Bolivia. Collections have been studied from the following herbaria, the letters in parenthesis being those used on the succeeding pages to indicate the location of the specimens cited: Field Museum of Natural History (F); United States National Herbarium, Washington (W); New York Botanical Garden (Y); Gray Herbarium of Harvard University (G); Missouri Botanical Garden, St. Louis (M); Botanic Garden and Museum, Berlin-Dahlem (B); Royal Botanic Gardens, Kew (K); Riksmuseets Botaniska Afdelning, Stockholm (S); Jardin Botanique Principal, Leningrad (L).

The writer wishes to express his sincere appreciation of the courtesy of the loans of Bolivian material made by the curators of the herbaria named above. He understands from personal experience the amount of labor involved in making such loans, and the inconvenience that they sometimes occasion, but he hopes that this may be repaid in part by the determination of the large number of unnamed sheets received, many of them collected forty to seventy years ago, and by the correction of the erroneous determinations upon the majority of the sheets supposedly already determined.

The material received on loan included practically all the Bolivian Rubiaceae of the United States National Herbarium, selected by Ellsworth P. Killip. This sending was especially rich in Buchtien collections. From the New York Botanical Garden, through the courtesy of Dr. Elmer D. Merrill, there were received for study a number of Dr. H. H. Rusby's types that are not represented by duplicates in other herbaria. Through the kindness of the Director, Dr. L. Diels, and Dr. K. Krause, there were received from Berlin on

loan a large number of undetermined *Psychotrieae* and *Coussareae*. The collections received from Kew were particularly valuable because of the Pearce numbers, which were not represented in any of the sendings from other sources.

KEY TO THE TRIBES AND GENERA[1]

Ovules 3 or more in each cell of the ovary.

Fruit dry.

Flowers arranged in very dense, globose heads....I. *Naucleeae.*

Flowers not in dense globose heads.

Seeds winged, vertically imbricate.....II. *Cinchoneae.*

Seeds not winged or, if winged, horizontal.

Corolla lobes imbricate or contorted, never valvate. IV. *Rondeletieae.*

Corolla lobes valvate.

Seeds horizontal; stipules entire or bifid; plants trees or large shrubs.....III. *Condamineae.*

Seeds peltately attached; stipules often fimbriate; plants usually herbs or low shrubs.....V. *Hedyotideae.*

Fruit fleshy.

Corolla lobes valvate.....VI. *Mussaendeae.*

Corolla lobes imbricate or contorted.

Seeds many, minute, pitted or rarely tuberculate. VII. *Hamelieae.*

Seeds usually few and large, the testa smooth or fibrous. VIII. *Gardenieae.*

Ovules 1 or 2 in each cell of the ovary.

Ovules pendulous.

Stamens inserted in the throat of the corolla tube; fruit not compressed.....IX. *Guettardeae.*

Stamens inserted at the base of the corolla tube; fruit strongly compressed.....X. *Chiococceae.*

Ovules erect or ascending.

Corolla lobes contorted.....XI. *Ixoreae.*

Corolla lobes valvate.

Ovules affixed to the base of the ovary.

Ovary 1-celled, or 2-celled but with a very thin septum. XII. *Coussareae.*

[1]The key is adapted from that published by Wernham for the American genera of Rubiaceae. See Journ. Bot. 54: 326. 1916.

Ovary with 2 or more cells, the septa thick.

Flowers perfect; stamens usually inserted in the throat of the corolla; plants usually trees or shrubs.

Style short; fruit drupaceous; plants seldom if ever scandent.....XIII. *Psychotrieae.*

Style elongate; fruit dry, dehiscent; plants scandent. XIV. *Paederieae.*

Flowers usually dioecious; stamens usually inserted at the base of the corolla; plants mostly herbaceous. XV. *Anthospermeae.*

Ovules affixed to the septum.

Stipules fimbriate, not leaflike.....XVI. *Spermacoceae.*

Stipules resembling the leaves and forming whorls with them.....XVII. *Galieae.*

I. NAUCLEEAE

A single genus in Bolivia.....1. *Uncaria.*

II. CINCHONEAE

Corolla lobes valvate.

Placenta ascending or erect from the base of the septum.

Plants scandent.....2. *Manettia.*

Plants erect.....3. *Hindsia.*

Placenta adnate to the middle of the septum.

Leaves coarsely crenate.....4. *Heterophyllaea.*

Leaves entire.

Flowers solitary; a low shrub. Flowers with a very long and narrow tube.....5. *Lecanosperma.*

Flowers numerous, in several- or many-flowered inflorescences; trees or large shrubs.

Capsule splitting from below upward.....6. *Cinchona.*

Capsule splitting from above downward.

Capsule loculicidal.....7. *Macrocnemum.*

Capsule septicidal.....8. *Ladenbergia.*

Corolla lobes imbricate or contorted.

Calyx lobes unequal, one of them often expanded into a large colored limb.....9. *Calycophyllum.*

Calyx lobes equal or nearly so, none of them expanded into a large limb.

Stamens unequal.....10. *Ferdinandusa.*

Stamens equal.

Calyx caducous; seeds bearded.....11. *Hillia.*

Calyx persistent.

Corolla lobes contorted; flowers solitary or clustered. 12. *Cosmibuena.*

Corolla lobes imbricate; flowers in cymes..13. *Wernhamia.*

III. CONDAMINEAE

Calyx lobes unequal, one of them expanded into a large colored limb. 14. *Pogonopus.*

Calyx lobes equal or nearly so.....15. *Condaminea.*

IV. RONDELETIEAE

Corolla lobes imbricate.

Calyx lobes unequal, one of them often expanded into a large colored limb.....16. *Warscewiczia.*

Calyx lobes equal or nearly so.

Seeds large; capsule loculicidal.....17. *Sickingia.*

Seeds small; capsule septicidal.....18. *Bathysa.*

Corolla lobes contorted.

Plants small herbs.

Stamens included; leaves opposite.....19. *Sipanea.*

Stamens exserted; leaves verticillate.....20. *Limnosipanea.*

Plants shrubs or trees.....21. *Elaeagia.*

V. HEDYOTIDEAE

A single genus in Bolivia.....22. *Arcytophyllum.*

VI. MUSSAENDEAE

Inflorescence terminal.

Inflorescence elongate, spikelike.....23. *Gonzalagunia.*

Inflorescence thyrsiform-paniculate.....24. *Isertia.*

Inflorescence axillary.

Plants creeping, herbaceous.....25. *Coccocypselum.*

Plants usually scandent and more or less woody.....26. *Sabicea.*

VII. HAMELIEAE

Ovary 4–5-celled.

Corolla lobes contorted in bud; corolla white.....27. *Bertiera.*

Corolla lobes imbricate in bud; corolla red or yellow. . 28. *Hamelia.*

Ovary 2-celled . . . . . 29. *Hoffmannia.*

VIII. GARDENIEAE

Flowers perfect.

Inflorescences terminal or terminal and axillary.

Corolla not regular, the buds curved. Corolla with an extremely long and narrow tube . . . . . 30. *Posoqueria.*

Corolla regular, the buds not curved.

Flowers arranged in many-flowered cymes . . . . . 31. *Tocoyena.*

Flowers solitary or 3–4 in a head . . . . . 32. *Randia.*

Inflorescences lateral.

Corolla tube villous in both throat and base; testa of the seeds fibrous . . . . . 33. *Genipa.*

Corolla tube villous in either throat or base, but not in both; testa not fibrous . . . . . 32. *Randia.*

Flowers dioecious.

Stipules forming a conical cap, deciduous above a circular slit.

Staminate flowers in cymes, the pistillate usually solitary, rarely 2–3 in a head . . . . . 34. *Duroia.*

Staminate and pistillate flowers both in cymes . . . 35. *Amaioua.*

Stipules free, or connate at the base, not forming a cap that is dehiscent by a transverse slit.

Staminate inflorescences lateral; plants often armed with spines. 32. *Randia.*

Staminate flowers terminal; plants unarmed . . . . . 36. *Alibertia.*

IX. GUETTARDEAE

Corolla lobes imbricate in bud . . . . . 37. *Guettarda.*

Corolla lobes valvate in bud.

Corolla tube slender, much elongate; plants sometimes armed with spines.

Tips of the corolla lobes with short narrow conelike appendages. 38. *Chomelia.*

Tips of the corolla lobes unappendaged . . . . . 39. *Anisomeris.*

Corolla tube very short; plants unarmed . . . . . 40. *Malanea.*

X. CHIOCOCCEAE

A single genus in Bolivia . . . . . 41. *Chiococca.*

XI. IXOREAE

Calyx calyculate at the base.....42. *Coffea.*

Calyx not calyculate at the base.....43. *Ixora.*

XII. COUSSAREAE

Ovules connate, borne on a common basal column; seed vertical. 44. *Coussarea.*

Ovules separate in a 1-celled ovary, collateral, basilar; seed horizontal. 45. *Faramea.*

XIII. PSYCHOTRIEAE

Inflorescence an involucrate head.

Seeds flat on the inner side; creeping herbs.....46. *Geophila.*

Seeds deeply furrowed on the inner side; usually trees or shrubs. 47. *Cephaelis.*

Inflorescence not involucrate; flowers usually not in heads.

Stipules not pectinate, or very rarely so; seeds deeply furrowed or flat on the inner side.

Corolla tube not gibbous at the base; inflorescence usually not thyrsoid.....48. *Psychotria.*

Corolla tube gibbous at the base; inflorescence usually thyrsoid. 49. *Palicourea.*

Stipules pectinate; seed with inrolled ventral surface..50. *Rudgea.*

XIV. PAEDERIEAE

A single genus in Bolivia.....51. *Paederia.*

XV. ANTHOSPERMEAE

Fruit fleshy.....52. *Nertera.*

Fruit dry, separating into 2 cocci.....53. *Corynula.*

XVI. SPERMACOCEAE

Fruit dehiscent as a whole.

Fruit circumscissile.....54. *Mitracarpus.*

Fruit dehiscing longitudinally.....55. *Staelia.*

Fruit separating into cocci which may or may not dehisce.

Cocci 3 or more.....56. *Richardia.*

Cocci 2.

Cocci indehiscent.....57. *Diodia.*

Cocci dehiscent at the base or apex.

Cocci opening only at the base. Flowers axillary. 58. *Hemidiodia.*

Cocci opening at the apex.

Seeds winged; plants scandent; flowers in umbels. 59. *Emmeorrhiza.*

Seeds not winged; plants not scandent; flowers not in umbels.

Cells of the fruit unlike, one opening, the other remaining closed.....60. *Spermacoce.*

Cells of the fruit alike, both opening.....61. *Borreria.*

XVII. GALIEAE

Flowers surrounded by a calyx-like involucre.....62. *Relbunium.*

Flowers not involucrate.....63. *Galium.*

1. UNCARIA Schreb.

Uncaria guianensis (Aubl.) Gmel. Syst. 370. 1791. *Ourouparia guianensis* Aubl. Pl. Guian. 177. *pl. 168.* 1775.

Guanai, 600 m., *Rusby 2104* (F, W). Extending northward to the Guianas.

A large scandent shrub, armed with stout recurved spines; flowers small, white, in dense globose heads; fruit dry.

2. MANETTIA L.

Manettia asperifolia Standl. Field Mus. Bot. 4: 270. 1929.

Yungas, 1,800 m., *Rusby 2159* (F, type). In forests, Buenavista, Dept. Santa Cruz, *Steinbach 5598* (F, B, Y), *7065* (F, M). Santa Cruz, 1,000 m., May, 1892, *Kuntze* (W, Y). Buenavista, *Steinbach 5491* (Y).

Leaves short-petiolate, ovate or elliptic, 2–6 cm. long, acute, abruptly acuminate, or obtuse, at the base rounded or obtuse, densely rough-puberulent on both surfaces; cymes axillary, densely many-flowered, sessile or very shortly pedunculate; calyx 8-parted, the lobes lanceolate or narrowly ovate, 3–6 mm. long, acuminate; corolla red, pilosulous, the tube 12–22 mm. long, the lobes obovate-rounded.

Manettia Bangii (Rusby) Standl. Field Mus. Bot. 4: 271. 1929. *Lygistum Bangii* Rusby, Mem. Torrey Club 3^3: 43. 1893.

Yungas, *Bang 537* (F, W, M, type collection). Cochabamba, *Bang 1268* (F, M). Catarguato, near Sorata, 2,700 m., *Mandon 343* (K). Inchachaca, Dept. Cochabamba, 2,250 m., *Steinbach 9248* (B, Y).

Leaves ovate, 4–8 cm. long, acuminate, rounded at the base, subcoriaceous, puberulent or hispidulous when young but soon gla-

brous or nearly so; calyx lobes 4, broadly ovate, obtuse or acuminate; corolla dark red, glabrous outside, the tube 6 mm. long, the lobes 3 mm. long; capsule obovoid, 4–5 mm. long.

Manettia coccinea (Aubl.) Willd. Sp. Pl. 1: 624. 1797. *Nacibea coccinea* Aubl. Pl. Guian. 96. *pl. 37, f. 1.* 1775.

Yapacani, 400 m., June, 1892, *Kuntze* (W). San Carlos, 750 m., *Buchtien 1964* (W). Ranging northward to Mexico.

A slender, nearly glabrous vine; leaves thin, lanceolate to ovate, 3–10 cm. long, acute or acuminate; calyx lobes 8, linear or oblanceolate, 4–14 mm. long, ciliate, recurved; corolla red, 17–25 mm. long, more or less pilose outside; capsule subglobose, 6–10 mm. long, rounded at the base.

Manettia cordifolia Mart. Denkschr. Acad. Muench. 9: 95. *pl.* 7. 1824. *Guagnebina ignita* Vell. Fl. Flum. 45. *pl. 115.* 1825. *M. ignita* Schum. in Mart. Fl. Bras. 6^6: 170. 1889.

Milluguaya, 1,100 m., *Buchtien 4723* (W). Tunari, 3,000 m., in 1892, *Kuntze* (W). Without locality, *Bang* (Y). Also in Brazil, Paraguay, Argentina, and Peru.

Similar to the following variety, but the stems and leaves puberulent or short-pilose.

The Bang specimen was reported by Rusby (Bull. N. Y. Bot. Gard. 4: 368. 1907) as *Lygistum confertiflorum* (Benth.) Rusby.

Manettia cordifolia Mart. var. **glabra** (C. & S.), comb. nov. *M. glabra* C. & S. Linnaea 4: 159. 1829. *M. micans* Poepp. & Endl. Nov. Gen. & Sp. 3: 24. 1845. *M. boliviana* Wernham, Gen. Manettia 20. 1919.

Guanai to Tipuani, *Bang 1372* (F, W, M, type collection of *M. boliviana*). Polo-Polo, Nordyungas, 1,100 m., *Buchtien 252* (F, M); in 1912, *Buchtien* (W). Mapiri, 1,500 m., *Rusby 1126* (F, W). Prov. Chapare, Dept. Cochabamba, 1,500 m., *Steinbach 9055* (B). Milluguaya, Nordyungas, 800 m., December, 1917, *Buchtien* (F). Guanai, 600 m., *Rusby 1127* (F). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7092* (F, M). Cochabamba, *Bang 1255* (F, M, W). Chiquicá, 1,000 m., *Fiebrig 2686* (W). Antahuacana, 750 m., *Buchtien 2265* (F, W). Río Piray, Dept. Santa Cruz, 450 m., *Steinbach 6240* (B, K). Ranging with the species.

A slender, nearly glabrous vine with large, lanceolate or ovate, long-acuminate, thin leaves; calyx lobes 4, thin, oblong or lanceolate, large and unequal; corolla bright red, 3–5 cm. long.

In describing *M. boliviana*, Wernham lays great stress upon the raised angles of the stems, which are furnished with minute reflexed teeth. These angles and teeth seem to be well developed only in tightly twining stems and nearly or quite absent on the larger ones. The subterete stems supposed to characterize *M. cordifolia* and the

angled ones described as distinguishing *M. boliviana* occur upon the same plant, and I do not believe that *M. boliviana* should be maintained even as a variety.

In *The Genus Manettia* Wernham credits the combination *M. cordifolia* var. *glabra* to Schumann, but the latter published no such name, referring the variety rather to *M. ignita*, which is a synonym of *M. cordifolia*.

Manettia divaricata Wernham, Gen. Manettia 41. 1919.

Cochabamba, *Bang 1269* (F, M, W, type collection). Also in Peru.

Leaves ovate-elliptic, acuminate, acute at the base, glabrous; calyx lobes 4, ovate, acute, thick and fleshy, 3 mm. long; capsule subglobose, glabrous, 8 mm. long.

Manettia Fiebrigii, sp. nov.—Herba volubilis, caulibus gracilibus cortice pallide brunnescente obtectis, novellis pilis debilibus patentibus vel reflexis villosis; stipulae extus villosae in vaginam 1–1.5 mm. longam connatae, parte libera brevi acutiuscula; folia petiolata membranacea opposita, petiolo gracili villoso 2–4 mm. longo; lamina ovata vel oblongo-ovata 1.5–3 cm. longa 1–1.5 cm. lata longe acuminata, acumine angusto longe attenuato, basi rotundata vel obtusa, supra viridis, ubique villosula, venis non elevatis, subtus pallidior, dense villosa, costa gracili prominente, nervis lateralibus utroque latere c. 4 gracillimis prominulis angulo acuto adscendentibus, nervulis obsoletis; flores in axillis fasciculati pauci, pedicellis villosis 2–3 mm. longis; hypanthium obovoideum 1–1.5 mm. longum dense villosum; calyx 4-partitus, laciniis linearibus vel subulatis rigidiusculis subpatentibus 1 mm. longis acutis; corolla extus glabra, tubo crasso 4 mm. longo superne vix dilatato fauce 2.5 mm. lato, lobis 4 ovato-ellipticis 2.5 mm. longis acutis subpatentibus intus dense villosis; capsula immatura subglobosa villosa 2 mm. longa. —Bolivia: Rocky slope, Tarija, alt. 2,200 m., January 28, 1904, *K. Fiebrig 2779* (Herb. Berol., type).

Manettia hispida Poepp. & Endl. Nov. Gen. & Sp. 3: 24. *pl. 228*. 1845.

Reported from Porongo, at 550 m., *Herzog 1494* (Med. Rijks Herb. 46: 22. 1922). Also in Peru.

Stipules oblong, acute; leaves elliptic or oblong, acute at the base and apex, densely pilose, the hairs enlarged at the base; calyx lobes 8, spatulate-oval, ciliate; corolla red, sparsely stiff-pilose, the tube nearly 1.5 cm. long; capsule ovoid, acute.

Manettia Pearcei Wernham, Gen. Manettia 36. 1919.

Type collected near Moro, at 1,200–1,500 m., *Pearce*. Wernham reports also *Pearce 288*, collected on the road to Cueva Grande, at 2,100 m. The species has been ascribed incorrectly to Colombia.

Leaves elliptic, 6–10 cm. long, acuminate, acute at the base, scaberulous above, hispidulous-pilose beneath; calyx 8-parted, the lobes lanceolate, 5 mm. long or more; corolla red, sparsely puberulous outside, the tube 15 mm. long, the lobes 6 mm. long.

Manettia Tatei, sp. nov.—Volubilis, caulibus gracilibus teretibus, vetustioribus ochraceis, novellis dense pilis retrorsis pallidis pilosis, internodiis elongatis; stipulae erectae persistentes pallidae triangulares usque ad 3 mm. longae subobtusae hispidulae integrae; folia petiolata opposita, petiolo gracili 2–5 mm. longo pilosulo; lamina crasse membranacea elliptica vel oblongo-elliptica 2.5–4 cm. longa, 1.2–2 cm. lata, acuta vel breviter abrupteque acuminata, acumine acuto, basi rotundata usque ad acuta, supra luteo-viridis, sparse pilosa, costa prominula, venis obsoletis, subtus pallidior, dense pilis albidis plus minusve intertextis piloso-tomentosa, costa gracili elevata, nervis lateralibus utroque latere c. 6 obliquis, angulo semirecto abeuntibus, gracilibus, prominentibus, juxta marginem conjunctis, nervulis obscuris; flores in axillis breviter laxeque racemosi, racemis paucifloris foliis brevioribus, interdum umbellati, umbellis breviter pedunculatis, bracteis parvis et inconspicuis, pedicellis gracilibus tomentosis plerumque 5–7 mm. longis; hypanthium obovoideum 1.5–2 mm. longum dense ochraceo-tomentosum; calyx 4-partitus, lobis orbicularibus 1–1.5 mm. longis patentibus vel subrecurvis dense tomentellis persistentibus; corolla 5 mm. longa superne tomentosa, tubo gracili supra paullo dilatato, lobis brevibus obtusis c. 1.5 mm. longis; capsula obovoidea dense tomentosa 3–3.5 mm. longa basi acuta.—Bolivia: Nequejahuira, Cordillera Real, alt. 2,400 m., May 15–24, 1926, *G. H. H. Tate 682* (Herb. N. Y. Bot. Gard., type).

Manettia tenuis (Britton) Wernham, Gen. Manettia 33. 1919. *Lygistum tenue* Britton ex Rusby, Mem. Torrey Club 6: 45. 1896. *M. Rusbyana* Sprague ex Wernham, loc. cit., as synonym.

Near Sorata, *Bang 1725* (F, W, M, type collection). Espíritu Santo, *Bang 1268* (F). Mapiri, 750 m., *Rusby 2158* (W). Río Juntas, 1,000 m., April, 1892, *Kuntze* (W). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7519a* (W), *7519* (W), *7620* (W). San Carlos, Mapiri region, 600 m., *Buchtien 1432* (F, B).

Leaves oblong-ovate, 4–7 cm. long, acuminate, obtuse at the base, thin, minutely pilose along the costa, elsewhere glabrous; calyx lobes 4, linear, 2–2.5 mm. long; corolla described as about 1 cm. long; capsule globose-obovoid, 4 mm. long.

Manettia tomentosa (Rusby), comb. nov. *Lygistum tomentosum* Rusby, Descr. N. Sp. S. Amer. Pl. 131. 1920.

Type from Unduavi, North Yungas, at 3,300 m., *Buchtien 620*. Unduavi, 3,300 m., *Buchtien 913* (W), *2991* (W, B).

Leaves oblong to ovate, very thick, acute, rounded at the base, 2–4 cm. long, 1.5–2 cm. wide, tomentose; calyx lobes triangular-

ovate, acutish, 6 mm. long; corolla tube about equaling the calyx, the lobes about as long as the tube; capsule 6–7 mm. long, acutish at the base.

3. HINDSIA Benth.

Hindsia Fiebrigii Krause, Bot. Jahrb. Engler 40: 320. 1908.

Rocky places, Toldos, near Bermejo, alt. 2,100 m., *Fiebrig 2396* (photo. and fragm. of type ex Herb. Berol. in F).

A shrub 1 m. high; leaves short-petiolate, ovate or ovate-lanceolate, 3–6 cm. long, acute at the base and apex, sparsely white-pilose beneath on the nerves; flowers in terminal 6–10-flowered cymes; calyx lobes 5, lanceolate, acute, 7–8 mm. long; corolla white, funnelform, the tube 4–7 cm. long, the 5 lobes ovate, 1 cm. long; capsule globose, 6–8 mm. in diameter.

4. HETEROPHYLLAEA Hook. f.

Heterophyllaea pustulata Hook. f. Icon. Pl. *pl. 1134*. 1873; Schum. in E. & P. Nat. Pfl. 4^4: 49. *f. 18, F, G*. 1891.

Type from Bolivia.

A small shrub with oblong glandular-pustulate leaves; flowers large, in terminal clusters, white, fragrant; calyx lobes linear-lanceolate, acuminate.

H. Mandonii Schum., loc. cit., is a name only, based on a Bolivian plant.

5. LECANOSPERMA Rusby

Lecanosperma lycioides Rusby, Bull. Torrey Club 20: 431. *pl. 168*. 1893.

Type collected in the region of Cochabamba, *Bang 1121*. Cochabamba, *Bang 1122* (F, G, W). La Granja, 2,600 m., *Julio 146* (W). Cotaña, 2,600 m., *Buchtien 3263* (F, W). Aranjuez, 3,100 m., *Buchtien 5771* (W). Without locality, *Bridges* (K). Without definite locality, *Bridges 164* (L). Also in Peru.

A stiff much-branched shrub 2 m. high or less; leaves elliptic-oblong, 3–12 mm. long, glabrous or nearly so; flowers terminal, solitary; corolla deep violet, nearly 2 cm. long, the tube slender; capsule 6 mm. long.

Herzog reports the vernacular name "aceguera" for the plant.

6. CINCHONA L.

In enumerating the Rubiaceae of Ecuador, the writer already has quoted at length an account of the discovery of the cinchona trees, and of their introduction into the East Indies (see Field Mus. Bot. 7: 188. 1931). Those who wish to inform themselves upon this interesting subject are recommended to read Clements R. Markham's *Peruvian Bark* (London, 1880), which gives a full and well written account of the subject.

From this book there may be quoted here the following extract regarding the cinchona districts of Bolivia:

The cinchona region of Bolivia and southern Peru, although one of the most important, was the last to contribute supplies of bark to the European markets. The trees first became known through the investigations of the German botanist Thaddaeus Haenke, and a Spanish naval officer named Rubin de Celis, who drew the attention of the inhabitants to the valuable forests on the eastern slopes of the Bolivian Andes in 1776, though the unfortunate French naturalist Joseph de Jussieu had previously explored some portions of those forests. But it was not until 1820, when quinine was first recognized as the febrifuge principle of bark, that the *Cinchona calisaya* was recognized as containing more of that alkaloid than any other species.

After 1820 the demand for *calisaya* bark increased enormously; great numbers of cascarilleros, or bark-collectors, entered the forests, and in a short time scarcely a tree remained in the vicinity of inhabited places; and the bark was exported in such quantities that the price fell very much. It was not, however, until 1830 that the Bolivian government interfered in the bark trade. It was then considered necessary by General Santa Cruz's administration to check the drain of this precious source of wealth by limiting the quantity of bark to be cut or exported; and in November, 1834, the Bolivian Congress decreed a law on the subject, which, however, never took effect. Finally, the cutting was prohibited for five years, but before the expiration of that period the decree was abrogated, and an export duty of twenty dollars the quintal, or cwt. was imposed.

In 1844 the Bolivian Congress authorized the President, General Ballivian, to negotiate for the establishment of a national bank of bark, with the requisite capital, to export all the quinquina bark produced in the country. This Bolivian legislation on the cinchona bark, which is considered, with justice, the most important product of their country, is very curious, and sufficiently demonstrates the futility of attempting a system of protection and monopoly. Instead of taking measures to prevent the reckless destruction of the trees, to establish extensive nurseries for young plants, and thus ensure a constant and sufficient supply of bark, these Bolivians have meddled with the trade, attempted to regulate European prices by the most barbarous legislation, and allowed the forests to be denuded of cinchona-trees.

There follows a detailed account of the somewhat erratic policies followed by the Bolivian government in regulating the cinchona industry. In one period of two years 3,000,000 pounds of bark were exported from the country.

Markham's account continues:

For exportation the bark used to be wrapped in fresh bullock-hides, having been previously sewn up in thick cotton bags containing 155 pounds each. These hide packages are called *serons*, a mule-

load being 285 pounds, and the transport to the coast costs about ten dollars for each mule-load. The bark from Bolivia now comes in bales.

It is to the persevering energy and great talent of that distinguished French botanist Dr. Weddell that we owe our knowledge of the cinchona regions of Bolivia and southern Peru, and especially of the inestimable quinine-yielding species which he identified as the *C. calisaya*.

Dr. Weddell derives the name of this species from the Quichua words *colli* (red) and *saya* (form); Poeppig from *colla* (a remedy) and *salla* (rocky ground); Von Tschudi from *collisara* (reddish maize). Dr. Laefdael, the Judge of Caravaya, told me it came from *ccali* (strong) and *sayay* (become or be thou). Calisaya is the name of a family of Indian Caciques in Caravaya, one of whom acted an important part in the revolt of 1780–81. The plant may have been called after him.

Dr. Weddell accompanied the scientific expedition of the Count de Castelnau, which was sent out by Louis Philippe to South America, and, after crossing the vast empire of Brazil, entered Bolivia by the country of the Chiquitos in August, 1845. It was Dr. Weddell's chief object to examine the cinchona region of this country, and his first step was to proceed to Tarija, to ascertain the extreme southern limit of the cinchona-trees, which he discovered in 19° S. lat. He named the species *C. australis*. Dr. Weddell then commenced a thorough exploration of the Bolivian cinchona forests, making his way over the most difficult country, from Cochabamba, through Ayopaya, Enquisivi, and the *yungus* of La Paz; where the species of Cinchonae continued to multiply under his eye. In Enquisivi he first met with and studied the *C. calisaya*, which he named and described, collecting much information respecting the trade, and the methods of collecting bark. In 1847 he entered the province of Caupolicán, descending the river Tipuani, where he was attacked by fever, and ascending the Mapiri. At Apollobamba, the center of the most ancient bark-collecting district, he found that the surrounding forests were quite cleared of cinchona-trees, and that it was necessary to seek for them at a distance of ten or twelve days' journey from any inhabited place.

Dr. Weddell's valuable monograph on the *Cinchona* genus, *Histoire naturelle des Quinquinas*, the most important work that, up to that time, had appeared on the subject, was published at Paris in 1849.

In 1851 Dr. Weddell undertook a second voyage to South America, and in 1852 he entered the Bolivian cinchona region of Tipuani by way of Sorata. He encountered the first forest cinchona-trees at an elevation of 7,138 feet, being the *C. ovata* var. *vulgaris*. Descending still, he came to paccay-trees (*Inga* sp.) in flower, and met with the first plant of the shrubby variety of *C. calisaya*, on an open grassy ridge or *pajonal*, at an elevation of 4,800 feet.

Dr. Weddell descended the river Tipuani to Guanay, a mission of Lecos Indians, and ascended the Coroico in a canoe made of the wood of a species of *Bombax*. There were many trees of *C. micrantha* on the banks of the Coroico, a species of *Cinchona*, the peculiarity of which is its fondness for the bottoms of valleys and banks of rivers, while most of the others prefer elevated ridges or slopes of the mountains. With it were growing trees of the beautiful *Ladenbergia magnifolia*, an allied genus with deliciously fragrant flowers.

The *cascarilleros* of Bolivia lead a hard and dangerous life. They only value the *C. calisaya*, the other species being for them *carhua-carhua*, a name given to all the inferior kinds. Those who carry the bark on their shoulders from the interior of the forests receive fifteen dollars for every quintal, and they also have to carry all their provisions and covering for the night. If by any accident they are lost, or their provisions are destroyed, they die of hunger.

The *C. calisaya* species has been divided by Dr. Weddell into two varieties, namely *vera* and *Josephiana*. The former, when growing under favorable circumstances, is a tall tree, often larger round than twice a man's girth, with its leafy head rising above all the other trees of the forest. The leaves are oblong or lanceolate-obovate, pitted in the axils of the veins, with a shining green surface, and reddish veins. The flowers, which hang in large panicles, are a rosy-white color, with laciniae rose-color, and bordered by marginal white hairs. The capsule is smooth, and about twice as long as broad. This tree grows on declivities, and steep rugged places of the mountains, from 4,900 to 5,900 feet above the sea, in the forests of Enquisivi, Caupolicán, Apollobamba, and Larecaja in Bolivia, and of Caravaya in Peru. The trunk may be known by the periderm of the bark, sometimes of a grayish-white, sometimes brown or blackish, being always marked by longitudinal ridges or cracks, a characteristic remarked of no other tree of these forests, excepting one or two of the same family. The taste is strongly bitter, which is apparent directly the tip of the tongue touches it, and when the exterior receives a cut, a yellow gummy resinous matter exudes from it. The bark comes off with great ease, like peeling a mushroom, while in the inferior kinds, and above all in the false cinchonas, it strips transversely, and with much greater difficulty. A good tree yields 150 to 175 pounds of dried bark.

The other variety of *C. Calisaya*, called *ychu cascarilla*, or *cascarilla del pajonal*, by the natives, was named *Josephiana* by Dr. Weddell after the unfortunate French botanist Joseph de Jussieu. It is a shrub, not attaining a greater height than six and one-half to ten feet, and growing on open grassy slopes, at much higher elevations than the tree *calisaya*. There is another tree variety with a somewhat darker leaf, which Dr. Weddell classed as a distinct species, and called *C. boliviana* in 1849, but which he afterwards considered to be a mere variety of *C. calisaya*. The other good kinds in the forests of Bolivia and Caravaya are *C. micrantha*, and two varieties of *C. ovata*.

Dr. Weddell brought seeds of *C. calisaya* to Paris, which were raised in the Jardin des Plantes in 1848, and others in the garden of the Horticultural Society of London, where one of the plants flowered. Many of these plants were given away, and some of them were sent by the Dutch government to Java.

When in 1859 the British government laid careful plans for the introduction of cinchona trees into the mountains of India, the direction of the project was entrusted to Markham, author of the book just quoted. He arranged for collection of seeds and plants in all the chief production centers of the Andes, and the collection of material in Bolivia was entrusted to Charles Ledger, who had resided in Bolivia and Peru for more than twenty years. Regarding the success of Ledger's undertaking, Markham gives the following account:

In his endeavor to secure a supply of the best *Calisaya* seeds, Mr. Ledger sent for his old servant Manuel in 1861, and gave him the necessary instructions for collecting seeds from the best kinds of cascarilla trees. The Bolivian bark collectors recognize three kinds, called *roja*, *morada*, and *naranjada*. The leaves of the *roja* variety of *Calisaya* are bright scarlet underneath, and dark green above. This kind is considered to produce the richest bark.

Manuel Mamani, with his sons, proceeded to the cinchona forests as bark collectors, but the best trees did not produce ripe fruit for four years. When in full flower and most promising, a frost in April always destroyed the ripening prospect. Old Manuel waited patiently, year after year, cutting bark with his sons and looking out for an opportunity of fulfilling Mr. Ledger's commission. At last the time came. He gathered seeds from about fifty trees, chiefly of the *roja* kind, and safely delivered them to Mr. Ledger, in June, 1865. He was paid well, and instructed to return for more seeds of the *roja*, *morada*, and *naranjada* varieties of *Calisaya*. Poor Manuel's fate was very melancholy. The Bolivians are extremely jealous of their bark monopoly. The Corregidor of Coroico, one of the forest provinces to the east of the Andes, seized the seed collector and threw him into prison, where he was beaten to make him confess who the seeds found on him were for. After being confined in prison for about three weeks, beaten and half starved, he was at last set at liberty, robbed of his donkeys and blankets, and all he possessed. This most faithful old servant, the true-hearted Manuel Incra Mamani, died from the ill-treatment he had received very soon afterwards.

Manuel's son brought the news to Mr. Ledger, having come to account honestly for the money his father had received. It is a sad story; but at the same time it is very pleasant to have to record these noble traits of character in the Indians, the descendants of men who formed and organized the glorious empire of the Incas. Owing to the dangers to which the poor Indians were exposed in

collecting seeds, Mr. Ledger resolved not to employ them again on such hazardous duty. Old Manuel had served him faithfully for thirty years.

The seeds collected in 1865, and delivered to Mr. Ledger in June of that year, were very carefully and judiciously dried and packed, and arrived at their destination in excellent condition. They were sent to London, to the care of Mr. Ledger's brother, who sold half to the Dutch Government for the Java plantations, and half to Mr. Money, a cinchona planter on the Nilgiri hills. As many as 20,000 seeds germinated in Java, and a still greater number in India, producing numerous varieties. The plants, of which 7,000 survived in Java, had increased in number to 40,000 in 1874, and in 1875, 10,977 had been planted out.

These plants yield an extraordinarily large quantity of quinine, as much as 9.97 per cent. In this respect they are unequaled, so that the service thus performed by Mr. Ledger is one of very great importance, which deserves special recognition. Mr. Howard has appropriately named the richest of quinine yielding trees the *C. Calisaya* var. *Ledgeriana*.

Cinchona asperifolia Wedd. Ann. Sci. Nat. III. 10: 7. 1848.

Described from Bolivia, without indication of locality or collector.

Leaves ovate or oblong-lanceolate, acute, pilose on both surfaces, in age rough above; capsule linear-oblong.

Cinchona Humboldtiana Lamb. Ill. Cinch. 7. 1821.

Río Miguelito, 1,500 m., May 15, 1892, *Kuntze* (F, M). Also in Peru and Ecuador.

Branchlets villous; leaves lanceolate to elliptic, acute at each end, finally glabrate above, densely villous beneath; panicles dense, villous; calyx teeth very short, acute; capsule oblong, 2–2.5 cm. long, villous or glabrate.

The Kuntze collection was distributed as a variety of *C. carabayensis* Wedd.

Cinchona micrantha R. & P. Fl. Peruv. 2: 52. *pl. 194*. 1799.

Monterico, 900–1,500 m., March, 1867, *Pearce* (K). Reported from various other localities in Bolivia. Also in Peru and Ecuador.

A medium-sized tree, the branchlets sericeous or glabrate; stipules ovate, obtuse, glabrous; leaves petiolate, oval, obovate, or rounded, obtuse to rounded at the apex, acute to rounded at the base, large, coriaceous, nearly glabrous but usually pilose beneath along the costa; inflorescence large, terminal, open, many-flowered, paniculate, minutely tomentose, leafy; hypanthium minutely tomentose; calyx minute, 5-dentate, the teeth acute, purplish; corolla pink, about 6 mm. long, densely tomentulose, the lobes much shorter than the tube, villous within; capsule oblong, acute, about 1.5 cm. long, striate.

Called "quina canela," according to Herzog. This species formerly was a source of the drug quinine.

Cinchona officinalis L. Sp. Pl. 172. 1753. *C. lancifolia* Mutis, "Periódico de Santa Fe" 465. 1793. *C. nitida* R. & P. Fl. Peruv. 2: 50. *pl. 191.* 1799. *C. lanceolata* R. & P. Fl. Peruv. 2: 51. 1799. *C. Condaminea* Humb. & Bonpl. Pl. Aequin. 1: 33. *pl. 10.* 1808. *C. macrocalyx* DC. Bibl. Univ. 41: 150. 1829. *C. calisaya* Wedd. Ann. Sci. Nat. III. 10: 6. 1848 (type from Bolivia). *C. amygdalifolia* Wedd., loc. cit. (described from Bolivia and Peru). *C. boliviana* Wedd., op. cit. 7. 1848 (type from Bolivia). *C. calisaya* α *calisaya vera* Wedd. Ann. Sci. Nat. III. 11: 269. 1849. *C. calisaya* β *Josephiana* Wedd., loc. cit. *C. Condaminea* δ *lancifolia* Wedd., loc. cit. *C. lancifolia* var. *calisaya* Wedd. Ann. Sci. Nat. V. 12: 35. 1869. *C. Forbesiana* Howard ex Wedd., op. cit. 36. 1869 (type from banks of Río Mapiri, Larecaja, at 300–1,200 m., *Forbes*). *C. calisaya* var. *microcarpa* Wedd. Ann. Sci. Nat. V. 11: 361. 1869 (type from Valley of Coroico, Yungas). *C. calisaya* var. *boliviana* Wedd., loc. cit. 1869. *C. calisaya* var. *oblongifolia* Wedd., loc. cit. 1869 (type from Yungas). *C. calisaya* var. *pallida* Wedd., loc. cit. (type from Valley of Tipuani, Larecaja). *C. Josephiana* Wedd., loc. cit. 1869. *C. Josephiana* subvar. *glabra* Wedd., loc. cit. 1869. *C. Josephiana* subvar. *pubescens* Wedd., loc. cit. 1869. *C. Josephiana* subvar. *discolor* Wedd., loc. cit. 1869 (type from Valley of Petechuco). *C. Weddelliana* Kuntze, Monogr. Cinchona 29. 1878 (type from Bolivia). *C. Ledgereana* Moens ex Trimen, Journ. Bot. 19: 323. 1881.

Sorata, *Bang 1612* (F, M). Sierra de Santa Cruz, 700 m., June, 1892, *Kuntze* (M). Sirupaya, South Yungas, 2,050 m., *Buchtien 255* (W). Mapiri, 1,350 m., *Rusby D1* (F, Y), *C1* (M), *J3* (M), *F1* (M), *F5* (F). San Carlos, region of Mapiri, 850 m., *Buchtien 1410* (B), *1425* (B); at 950 m., *Buchtien 1418* (B). San José, region of Mapiri, 1,000 m., *Buchtien 1427* (B). Without locality, *Rusby F2* (F). Province of Yungas, *Weddell 4108* (W). Milluguaya, North Yungas, 900 m., *Buchtien 762* (F). Yungas, *Bang 510* (F, M, W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3913* (B, W), *3914* (B, W), *3915* (B, W). Mapiri, 1,350 m., *Rusby H4* (Y), *K1* (Y), *H5* (Y). San Carlos, Mapiri region, 950 m., *Buchtien 1419* (B, W), *1420* (B, W); at 850 m., *Buchtien 1422* (B, W), *1426* (B, W). San José, Mapiri region, 1,000 m., *Buchtien 1424* (B, W). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7496* (B, W), *7497* (B, W), *7498* (B, W). San Carlos, *Buchtien 1421* (F, B), *1423* (F, B). Ranging northward to Colombia.

A large or medium-sized tree, or sometimes only a shrub, the trunk occasionally as much as 1–1.5 m. in diameter, the bark rugose, fuscous, the branchlets strigillose-pilosulous; stipules free, lanceolate or oblong, acute or obtuse, glabrous, deciduous; leaves petiolate, lanceolate to elliptic or ovate, small, acute, acuminate, or obtuse, at the base attenuate to rounded, subcoriaceous, glabrous above, beneath glabrous or puberulent or hispidulous, especially on the veins, commonly about 10 cm. long and 3.5–4 cm. wide, often scrobiculate beneath;

inflorescence terminal, leafy, cymose-paniculate, dense, many-flowered; hypanthium strigose; calyx glabrous or nearly so, reddish, the teeth triangular, acute; corolla pink or red, sericeous, the tube about 1 cm. long, the 5 lobes ovate, acute; capsule oblong, striate-costate, usually 1.5–2 cm. long, glabrate.

Known in Bolivia by the following names and probably by still others: Quina amarilla, calisaya, calisaya zamba, calisaya zambita, cascarilla morada, quina morada, calisaya blanca, calisaya morada, calisaya verde morada.

Cinchona pubescens Vahl, Skrivt. Naturh. Selsk. 1: 19. 1790. *C. hirsuta* R. & P. Fl. Peruv. 2: 51. *pl. 192.* 1799. *C. purpurea* R. & P., op. cit. 52. *pl. 193.* 1799. *C. ovata* R. & P., op. cit. 52. *pl. 195.* 1799. *C. cordifolia* Mutis ex Willd. Ges. Naturf. Freund Berlin Mag. 1: 117. 1807. *C. asperifolia* Wedd. Ann. Sci. Nat. III. 10: 7. 1848 (type from Bolivia). *C. australis* Wedd., loc. cit. 1848 (type from Bolivia). *C. Pelletieriana* Wedd., op. cit. 8. 1848 (described from Bolivia and Peru). *C. purpurascens* Wedd., loc. cit. 1848 (described from Bolivia and Peru). *C. Chomeliana* Wedd., op. cit. 9. 1848 (type from Bolivia). *C. pubescens α Pelletieriana* Wedd. Ann. Sci. Nat. III. 11: 270. 1849. *C. succirubra* Pavón ex Klotzsch, Abh. Akad. Berl. 1857: 60. 1858.

Tunari, 3,300 m., in 1892, *Kuntze* (F, M). Without locality, *Bang 2229* (F, M). Mapiri, 1,350 m., *Rusby K2* (F, M). Guanai to Tipuani, *Bang 1404* (F, M). Without locality, *Rusby E9* (W). San Carlos, near Mapiri, 800 m., *Buchtien 1644* (F). Sarampiuni, Mapiri region, 600 m., *Buchtien 1407* (B, W), *1409* (W). Sarampiuni, region of Mapiri, 500 m., *Buchtien 1409* (B). Forest of Kuriloma, San Onufre, Dept. Cochabamba, 1,700 m., *Steinbach 9330* (B). Extending to Colombia.

A medium-sized tree, the trunk about 30 cm. in diameter, the branchlets variously pubescent; stipules free, large, ovate, obtuse or acute, caducous, sericeous or nearly glabrous; leaves petiolate, usually broadly ovate to orbicular, large, rounded to acute at the apex, at the base cordate to acute, often decurrent, usually glabrate above but often pubescent, beneath densely pilose to nearly glabrous, often scrobiculate; inflorescence terminal, leafy, paniculate, large and many-flowered, open, the flowers subsessile; hypanthium sericeous; calyx 5-dentate, minutely sericeous or tomentulose; corolla red or pink, sericeous, the tube commonly about 1 cm. long, the lobes lanceolate, 5–7 mm. long, villous within; capsule lanceolate or oblong, striate-costate, glabrate, usually 1.5–2.5 cm. long.

Called "quina morada," according to Herzog.

7. MACROCNEMUM L.

Macrocnemum roseum (R. & P.) Wedd. Ann. Sci. Nat. IV. 1: 76. 1854. *Cinchona rosea* R. & P. Fl. Peruv. 2: 54. *pl. 199.* 1799. *M. hirsutum* Rusby, Mem. N. Y. Bot. Gard. 7: 370. 1927.

Rurrenabaque, 300 m., *Rusby 1296* (Y, type of *M. hirsutum;* photo. in F), *1593* (W, Y). Ranging northward to Colombia.

A tree; leaves oblong to obovate-oblong, 6–13 cm. long, obtuse, at the base cuneate to obtuse, glabrous above, puberulent beneath in the axils of the veins; inflorescence ferruginous-tomentose; corolla pink, 11–12 mm. long; capsule 1.5–2 cm. long.

Macrocnemum Sprucei Rusby, Mem. Torrey Club 6: 44. 1896.

Between Tipuani and Guanai, *Bang 1635* (F, M, type collection). Bosques de Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7273* (F), *7441* (F, M), *7084* (F, M). Also in Peru.

A small tree, sometimes 6 m. high, nearly glabrous throughout; leaves short-petioled, obovate, obtuse at the apex, obtuse or acutish at the base; corolla rose-purple, the tube 1 cm. long, the lobes pubescent within; capsule 1.5–2.5 cm. long.

Macrocnemum tortuosum Herzog, Repert. Sp. Nov. 7: 68. 1909.

Type from the rain forest of Quebrada de Cuñucu, alt. 600 m., *Herzog 308.*

A medium-sized tree; leaves obovate, broadly cuneate at the base, glabrous, about 18 cm. long and 9 cm. wide; corolla tube 1 cm. long, the lobes glabrous; capsule 3 cm. long.

8. LADENBERGIA Klotzsch

Ladenbergia carua (Wedd.), comb. nov. *Cascarilla carua* Wedd. Ann. Sci. Nat. III. 10: 12. 1848. *Cinchona carua* Miq. Ann. Mus. Bot. Lugd. Bat. 4: 275. 1868–69. *Buena carua* Wedd. Journ. Linn. Soc. 11: 187. 1869.

San Carlos, near Mapiri, 750 m., *Buchtien 2008* (W); at 850 m., *Buchtien 1403* (B, W), *1404* (B, F, W), *1405* (B, W), *1406* (B, W), *1417* (B, W). Mapiri, 1,350 m., *Rusby G1* (W). Also in Peru.

A tree, the branchlets ferruginous-tomentose; stipules large, free or connate at the base, obtuse or rounded, tomentose; leaves oblong or oval, very large, 30–40 cm. long or more, obtuse or acute, at the base cordate or rounded, pubescent or glabrate above, beneath ferruginous-tomentose; panicles large, terminal, rather few-flowered, the flowers white, very fragrant, calyx teeth short, triangular; corolla densely sericeous, 4.5–5 cm. long, the 5 lobes more than half as long as the tube; capsule oblong-clavate, 3.5–5 cm. long, ferruginous-tomentose.

Called "carua" and "cascarilla de mula."

Ladenbergia magnifolia (R. & P.) Klotzsch in Hayne, Arzneigew. 14: sub *pl. 15.* 1846. *Cinchona magnifolia* R. & P. Fl. Peruv. 2: 53. *pl. 196.* 1799. *Cascarilla magnifolia* Wedd. Ann. Sci. Nat. III. 10: 10. 1848. *Buena magnifolia* Wedd. Journ. Linn. Soc. 11: 186. 1869.

Tipuani to Guanai, *Bang 1661* (F, M, W). Yungas, 1,200 m., *Rusby 2348* (F). Sarampiuni, Mapiri region, 600 m., *Buchtien 1408* (B, W). Ranging northward to Colombia.

A tall or medium-sized tree with cinnamon-brown bark; stipules 2–3 cm. long, free or nearly so, acute, sericeous; leaves long-petiolate, coriaceous, elliptic to oblong-ovate or even rounded, 10–30 cm. long and 7–20 cm. wide or larger, acute to rounded at the base and apex, glabrous above, pubescent or glabrate beneath; inflorescence terminal, long-pedunculate, many-flowered, paniculate, the flowers white; calyx teeth 4–5, triangular-ovate, acute, tomentulose; corolla sericeous, 1.5 cm. long, the lobes about equaling the tube; capsule linear-oblong or lanceolate, 2.5–7 cm. long, 7–10 mm. broad, glabrate.

Called "cascarillo amarillo" and "cinchona" in Peru.

Ladenbergia magnifolia (R. & P.) Klotzsch, var. **rostrata** (Wedd.), comb. nov. *Cascarilla rostrata* Wedd. Ann. Sci. Nat. III. 10: 10. 1848. *C. magnifolia* γ *rostrata* Wedd. Ann. Sci. Nat. III. 11: 271. 1849.

Described from Bolivia and Peru.

Differing from the typical form in the capsule, which is linear-lanceolate and attenuate to each end.

Ladenbergia sericea, sp. nov.—Arbor alta, ramulis gracilibus plus minusve obtuse angulatis ochraceis, novellis dense sericeis cito glabratis, internodiis brevibus; stipulae persistentes ferrugineae oblongo-ovatae 1.5–2 cm. longae longiacuminatae extus sparse sericeae vel fere glabrae; folia breviter petiolata opposita crasse membranacea, petiolo crassiusculo 1–1.5 cm. longo sparse sericeo vel glabrato; lamina oblonga vel obovato-oblonga 14–22 cm. longa, 4–7 cm. lata abrupte acuminata, acumine angusto sensim acuminato, basi obtusa vel subacuta, supra fusco-viridis, primo sparse sericea sed cito glabrata, venis non elevatis, subtus paullo pallidior, brunnescens, primo dense pilis longis mollibus griseis adpressis dense sericea, serius glabrata, costa gracili elevata, nervis lateralibus utroque latere c. 20 angulo lato adscendentibus prominentibus gracilibus leviter arcuatis marginem fere attingentibus, nervulis vix prominulis arcte reticulatis; inflorescentia terminalis breviter vel longe pedunculata cymoso-paniculata 4–7 cm. longa et aequilata, laxe multiflora, ramis dense pilis longis griseis vel brunnescentibus sericeis, floribus sessilibus vel subsessilibus in cymulas paucifloras dispositis, bracteis caducis; hypanthium lineare c. 8 mm. longum dense adpresso-pilosum; calyx late campanulatus c. 5 mm. longus extus dense adpresso-pilosus ad medium 5-lobus, lobis late ovatis acutis vel breviter acuminatis intus glabris; corolla extus pilis longis fulvis adpressis vel adscendentibus dense induta, tubo crassiusculo 2 cm. longo 2.5 mm. crasso supra non dilatato, lobis patentibus oblongis vel ovato-oblongis crispis 7–8 mm. longis acutis vel acutiusculis intus fere glabris; capsula linearis 2.5–3.5 cm. longa c. 3 mm. crassa glabrata, valvis post

dehiscentiam valde tortis.—Bolivia: San Carlos, region of Mapiri, alt. 850 m., January 17, 1927, *Otto Buchtien 1395* (Herb. Field Mus. No. 608,975, type; duplicate in herb. Berol.).

The species may be recognized by the abundant, silky, glistening pubescence of the young leaves.

9. CALYCOPHYLLUM DC.

Calycophyllum multiflorum Griseb. Symb. Fl. Arg. 155. 1879.

Chiquiacá, 1,000 m., *Fiebrig 2729* (W). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7147* (F). Also in Paraguay and Argentina.

A tree 6–25 m. high; leaves oblong to elliptic, 4–6 cm. long, obtuse or acutish, beneath minutely appressed-pilose along the nerves, short-barbate in the axils; flowers in small dense leafy panicles; calyx lobes lance-subulate; corolla white, 4–5 mm. long.

Called "bayabecho," according to Steinbach.

Calycophyllum Spruceanum (Benth.) Hook. f. ex Schum. in Mart. Fl. Bras. 6^6: 191. *pl. 106*. 1889. *Eukylista Spruceana* Benth. Kew Gard. Misc. 5: 230. 1853.

Yapacani, June, 1892, *Kuntze* (W). Also in Peru and Brazil.

A tree 15–20 m. high; leaves petioled, oblong, short-acuminate, 9–17 cm. long, barbate beneath in the axils of the veins; corolla white, 6–7 mm. long; calyx 6–9-dentate; capsule oblong, 8–10 mm. long, puberulent.

10. FERDINANDUSA Pohl

Ferdinandusa Paxii Winkl. Repert. Sp. Nov. 7: 249. 1909.

San Antonio, near Mapiri, 850 m., *Buchtien 1610* (W, type collection). San Carlos, 750 m., *Buchtien 2094* (W). Charopampa, 570 m., *Buchtien 44* (W, F). Charopampa, 570 m., *Buchtien 1945* (W). Mapiri region, *Buchtien 1458* (F). Winkler reports also *Buchtien 1620, 1946, 2060,* and *2078*. Also in Peru.

A shrub or tree, sometimes 6 m. high, glabrous nearly throughout; leaves petiolate, ovate-oblong or elliptic-oblong, up to 20 cm. long, acuminate, lustrous; flowers corymbose-paniculate, the panicles terminal, sessile; calyx 4-dentate; corolla white, 15–18 mm. long, the lobes very short, rounded; capsule linear-cylindric, 4 cm. long, 6–7 mm. broad.

Called "chuchulli" and "chuchulli amarillo."

11. HILLIA Jacq.

Hillia boliviana Britton, Mem. Torrey Club 3^3: 43. 1893.

Yungas, *Bang 600* (F, W, type collection). Antahuacana, 750 m., *Buchtien 2217* (W). Santa Cruz, *Williams 1478* (W).

A glabrous shrub; leaves elliptic or obovate-elliptic, 6–9 cm. long, abruptly acuminate; calyx 3-lobed, the lobes ovate, acute; corolla tube 4.5 cm. long; capsule 9 cm. long, 1 cm. broad.

Hillia parasitica Jacq. Enum. Pl. Carib. 18. 1760.

Hacienda Simaco, 1,400 m., *Buchtien 5036* (W). Ranging to Brazil, Mexico, and the West Indies.

Usually an epiphytic shrub, but reported also as a small tree, glabrous; stipules large, caducous; leaves short-petiolate, elliptic or obovate, 6–14 cm. long, coriaceous, usually short-acuminate; calyx short, parted, the lobes unequal; corolla white, the slender tube 6–10 cm. long.

12. COSMIBUENA R. & P.

Cosmibuena grandiflora (R. & P.) Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907. *Cinchona grandiflora* R. & P. Fl. Peruv. 2: 54. *pl. 198*. 1799. *C. obtusifolia* R. & P. Fl. Peruv. 3: 3. *pl. 198*. 1802.

Mapiri, *Rusby 2103* (F, W). Ranging to Colombia.

A glabrous tree 5–12 m. high; leaves petiolate, elliptic, oval, or oblong-elliptic, rounded or very obtuse at the apex; calyx about 1 cm. long, corolla white or ochroleucous, the slender tube 5–9 cm. long.

13. WERNHAMIA S. Moore

Wernhamia boliviensis S. Moore, Med. Rijks Herb. 46: 23. 1922.

Type from thickets, Santa Cruz, *Herzog 1428*.

A shrub or small tree; stipules deciduous; leaves large, petiolate, the blades broadly ovate, 30–40 cm. long, rounded or obtuse at the apex, glabrous and shining above, pubescent beneath; inflorescences terminal, cymose, much shorter than the leaves, the flowers short-pedicellate; calyx 6-lobed, the lobes short, rounded, 3 mm. long; corolla greenish white, 28 mm. long, the 6 lobes scarcely 2 mm. long.

The vernacular name is reported as "iotavio."

14. POGONOPUS Klotzsch

Pogonopus tubulosus (DC.) Schum. in Mart. Fl. Bras. 6^6: 265. 1889. *Calycophyllum tubulosum* DC. Prodr. 4: 367. 1830. *Chrysoxylon febrifugum* Wedd. Hist. Quinq. 100. 1849. *P. febrifugus* Hook. f. in B. & H. Gen. Pl. 2: 47. 1873. *Howardia febrifuga* Wedd. Ann. Sci. Nat. IV. 1: 67. 1854. *P. febrifugus* Hook. f., var. *macrosema* Hutchinson, Kew Bull. 1910: 200. 1910.

Villamontes, *Pflanz 2053* (F). Tipuani to Guanai, *Bang 1716* (F), *1344* (F). Guanai, 600 m., *Rusby 2090* (F). Chiquiacá, 1,500 m., *Fiebrig 2705* (W). Milluguaya, North Yungas, 900 m., *Buchtien*

761 (F). Reported by Hutchinson, loc. cit., from Pata, *Pearce;* eastern Bolivia, *Gosling;* Tarija, *Pearce.* Type of *C. febrifugum* from Bolivia, *Weddell.* Also in Brazil, Argentina, and Peru.

A tree 10–15 m. high; leaves short-petioled, ovate, obovate, or elliptic, short-acuminate, densely pubescent or glabrate; cymes in terminal panicles; one of the calyx lobes in some of the flowers expanded into a large ovate red limb; capsule 7–9 mm. long.

"Quina morada." The bark contains an alkaloid, and is used locally as a substitute for quinine.

15. CONDAMINEA DC.

Condaminea corymbosa (R. & P.) DC. Prodr. 4: 402. 1830. *Macrocnemum corymbosum* R. & P. Fl. Peruv. 2: 48. *pl. 189.* 1799.

Edge of forest, San Onufre, Dept. Cochabamba, 1,600 m., *Steinbach 9292* (B). Extending northward to Panama.

A shrub about 1.5 m. high; leaves obovate, often broadly so, glabrous or nearly so; inflorescence brownish violet; corolla violet outside, green within; stamens brown.

Condaminea corymbosa (R. & P.) DC., var. **pubescens** Spruce ex Schum. in Mart. Fl. Bras. 6^6: 258. 1889. *C. angustifolia* Rusby, Mem. Torrey Club 6: 45. 1896.

Guanai to Tipuani, *Bang 1429* (F, type collection of *C. angustifolia*). Yungas, *Bang 610* (F). Apolo, *Williams 322* (W). San Miguel, Mapiri region, 800 m., *Buchtien 1393* (W). Sirupaya, South Yungas, 2,100 m., *Buchtien* (W). Also in Peru.

A shrub or small tree with large, nearly sessile, usually clasping, finely pubescent leaves; inflorescence terminal, long-pedunculate, as long as the leaves; calyx truncate or irregularly dentate; corolla 2.5 cm. long; capsule bisulcate, about 1.5 cm. long.

16. WARSCEWICZIA Klotzsch

Warscewiczia coccinea (Vahl) Klotzsch, Monatsb. Akad. Berlin 1853: 497. 1853. *Macrocnemum coccineum* Vahl, Symb. Bot. 2: 38. 1791. *W. splendens* Wedd. Ann. Sci. Nat. IV. 1: 72. 1854.

Guanai, 600 m., *Rusby 1953* (F). Yungas, 1,800 m., *Rusby 1954* (F), *Bang 284* (F). Ranging to Panama and Brazil.

A handsome and showy shrub or small tree; leaves petiolate, obovate to obovate-oblong, 15–60 cm. long, acute or short-acuminate, pubescent or glabrate beneath; cymes small and dense, forming a long narrow inflorescence; one of the calyx lobes in some of the flowers expanded into an oblong or elliptic, red limb 3.5–7 cm. long; corolla yellow; fruit a small capsule.

The type of *W. splendens* was collected in the Province of Yungas at 2,500 m.

17. SICKINGIA Willd.

Sickingia catappifolia, sp. nov.—Arbor 6–10-metralis, ramulis crassis subteretibus ochraceis glabris; stipulae caducae triangulari-lanceolatae longiattenuatae, apice subulatae, 2.5 cm. longae, sparse minuteque puberulae vel glabratae; folia opposita, petiolo crasso 0.7–2 cm. longo subtereti minute puberulo; lamina crasse papyracea vel subcoriacea, cuneato-obovata vel late obovata, 17–32 cm. longa, 7.5–19.5 cm. lata, obtusa vel acuta, interdum rotundata et breviter protracta, basin versus longe cuneatimque angustata, basi ipsa acuta vel rotundata, interdum undulata, supra glabra, nervis prominentibus, nervulis prominulis et conspicue reticulatis, subtus vix pallidior, saltem ad nervos minute puberula, costa crassa elevata, nervis lateralibus utroque latere c. 18, gracilibus, prominentibus, angulo lato adscendentibus, fere rectis, prope marginem conjunctis, nervulis prominulis arcte reticulatis; flores cymoso-corymbosi sessiles vel breviter pedicellati, in cymulas trifloras dispositi, ramulis puberulis; bracteae late ovatae obtusae vel acutae ciliolatae; hypanthium clavatum 6–7 mm. longum puberulum; calyx tubuloso-campanulatus 6–7 mm. longus puberulus vel glabratus, lobis 5 rotundatis ciliolatis; corolla luteo-viridis infundibuliformis, in alabastro cylindrica, 3.5 cm. longa, carnosa, in sicco multicostata, extus glabra, tubo basi 3–4 mm. lato, supra valde dilatato, apice 1.5 cm. lato, lobis brevibus vix 2 mm. longis, latissime rotundatis revolutis; filamenta alba c. 1 cm. longe exserta, 3 mm. supra basin tubi inserta, basi dense villosa, superne glabra, gracilia; antherae lineares 1.5 cm. longae; stylus 3.5 cm. longus gracilis glaber.—Bolivia: Forests of Río Surutú, Prov. Sara, Dept. Santa Cruz, alt. 450 m., in flower, December 15, 1924, *José Steinbach 6747* (Herb. Field Mus. No. 563,832, type). Charopampa, near Mapiri, 570 m., in fruit, November, 1907, *Buchtien 1958* (W).

Evidently this is closely related to *S. macrocrater* Schum., of Brazil, but it differs from that species in the short broad calyx lobes and in the pubescent inflorescence. Of the fruit only a few mutilated fragments are available, but it appears to be a capsule about 5 cm. long.

The leaves suggest those of *Terminalia Catappa*, hence the specific name.

Sickingia fragrans (Rusby), comb. nov. *Flexanthera fragrans* Rusby, Mem. N. Y. Bot. Gard. 7: 368. 1927.

San Buena Ventura, at 300 m., *Cárdenas 1738* (Y, type; photo. in F).

A small shrub with very fragrant, white flowers; leaves short-petiolate, ovate-oblong, 14–17 cm. long, obtusely acuminate, rounded or subcordate at the base, glabrous; flowers in dense terminal trichotomous corymbs shorter than the leaves; inflorescence puberulent; calyx lobes broadly ovate, obtuse; corolla puberulent, 5 mm. long, the lobes very short; stamens exserted.

In the Kew herbarium there is a specimen of the genus *Rondeletia* collected by Pearce, *No. 357*, and labeled as coming from the eastern Andes of Bolivia at 1,800 m. The genus is not known otherwise south of Ecuador, and I suspect that the locality is incorrect. The plant is very much like *R. colombiana* Rusby, but perhaps distinct. Without more accurate locality data I do not care to describe it.

18. BATHYSA Presl

Bathysa obovata (Ruiz) Schum., in herb., sp. nov. *Macrocnemum obovatum* Ruiz in herb.—Arbor vel frutex, ramulis crassis obtuse tetragonis dense fulvo-tomentosis; stipulae caducae, non visae; folia breviter petiolata opposita, petiolo crasso c. 1.5 cm. longo dense breviterque fulvo-piloso; lamina subcoriacea late obovato-oblonga c. 30 cm. longa et 13 cm. lata, apice obtusa vel anguste rotundata, basi obtusa vel subrotundata et abrupte breviter decurrens, supra dense hispidulo-pilosa, asperula, subtus dense patenti-pilosa, costa subtus elevata, nervis lateralibus utroque latere c. 20 angulo lato abeuntibus prominentibus leviter arcuatis gracilibus prope marginem conjunctis; inflorescentia terminalis longe pedunculata cymoso-paniculata c. 14 cm. longa et aequilata dense multiflora, ramis primariis oppositis adscendentibus dense fulvo-tomentosis, bracteis caducis, floribus dense glomeratis sessilibus; hypanthium late obconicum 2.5 mm. longum dense fulvo-tomentosum, calyce late campanulato 2 mm. longo truncato dense adpresso-piloso; corolla extus glabra in alabastro apice rotundata, 6–7 mm. longa, tubo crasso supra dilatato fauce dense barbato, lobis ovali-ovatis obtusis tubo subaequilongis intus glabris; stamina exserta, filamentis gracilibus glabris, antheris oblongis 2 mm. longis.—Peru: Chicoplaya, in 1798, *Tafalla* (Herb. Berol., type; photograph and fragment in herb. Field Mus.).—Bolivia: San Carlos, Mapiri region, 600 m., March 2, 1927, *Buchtien 1399* (F). Sarampiuni, Mapiri region, 600 m., May, 1927, *Buchtien 1402* (W).

19. SIPANEA Aubl.

Sipanea hispida Benth. ex Wernham, Journ. Bot. 55: 173. 1917. *S. pratensis* Schum. in Mart. Fl. Bras. 6^6: 249. 1889, in part, non Aubl.

Mapiri, *Bang 1488* (F, G); at 750 m., *Rusby 2461* (F, G, W). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6965* (F), *5481* (Y). Also in Brazil, Peru, and Paraguay.

An erect hirsute herb; leaves subsessile or short-petiolate, elliptic-lanceolate or lance-oblong, 4–6 cm. long, acuminate; flowers in dense headlike cymes; calyx lobes linear, 3–4 mm. long; corolla white or pinkish, the tube 6–9 mm. long.

20. LIMNOSIPANEA

Limnosipanea Kuntzei, sp. nov.—Herba gracilis 20–25 cm. alta, caulibus subteretibus, basi adscendentibus, supra pauciramosis, sparse breviterque pilosulis vel glabratis; folia verticillata vel suprema

opposita, plerumque 4–6, linearia vel rarius oblongo-lanceolata, 5–8 mm. longa, 1–2.5 mm. lata, attenuata, basi obtusa, sessilia, glabra, 1-nervia, infima reflexa; inflorescentia dichotoma multiflora laxa, floribus longipedicellatis rarius sessilibus, pedicellis gracilibus 1–1.5 cm. longis hinc inde pilosulis; bracteae et bracteolae foliaceae; sepala linearia vel lanceolato-linearia attenuata glabra, 1.5–2.5 mm. longa, ad apicem capsulae persistentia; capsula ovalis 2.5 mm. longa sparse hispida; semina minuta brunnescentia.—Bolivia: Velasco, alt. 200 m., July, 1892, *Otto Kuntze* (U. S. Nat. Herb. No. 701,742, type).

The type material is in an advanced fruiting stage, and the plants are somewhat weatherbeaten. The species is close to *L. Spruceana* Hook. f., of Brazil, but in that the flowers are sessile.

21. ELAEAGIA Wedd.

Elaeagia glomiflora, sp. nov.—Arbor 9–12-metralis, ramulis crassis subteretibus dense breviterque pilosis, internodiis brevibus; stipulae subpersistentes, crassae, erectae, oblongae, 2–2.5 cm. longae, acutae vel acuminatae, ferrugineae, extus dense adpresso-pilosae, intus glabrae; folia breviter petiolata opposita, petiolo crasso 2.5–4 cm. longo subtereti supra sulcato; lamina coriacea, late ovalis, 20–32 cm. longa, 14–23 cm. lata, apice rotundata, basi rotundata vel subcordata, supra fusca, praesertim ad nervos minute puberula vel glabrata, nervis non elevatis, subtus brunnescens, ubique dense pilis brevibus ferrugineis rigidiusculis patentibus hispidula, costa crassa elevata, nervis lateralibus utroque latere c. 19, prominentibus, gracilibus, angulo lato divergentibus, subarcuatis, prope marginem conjunctis, nervulis prominulis reticulatis; inflorescentia terminalis 1.5 cm. longe pedunculata pyramidali-paniculata, c. 8 cm. longa et 12 cm. lata, dense multiflora, basi trichotoma, ramis crassis angulo recto divaricatis densissime hispidulis, bracteis 3–5 mm. longis ovatis vel triangularibus acutis extus dense puberulis persistentibus, floribus in glomerulis densis multifloris aggregatis, sessilibus, glomerulis subglobosis 1 cm. diam.; capsula globoso-obovoidea, 3 mm. longa, dense fulvo-tomentosa, loculicide bivalvis, valvis demum bifidis; calyx 1.5 mm. longus 5-lobus, lobis ovatis obtusis extus tomentosis; semina numerosa minuta elongata angulata.—Bolivia: Monterico, March, 1867, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.).

Without corollas it is not at all certain that this tree belongs to the genus *Elaeagia*, but I have not been able to place it more satisfactorily elsewhere. It is altogether distinct in the shape and pubescence of the large leaves, and in the large dense headlike glomerules of the inflorescence.

Elaeagia grandis Rusby, Mem. Torrey Club 4: 208. 1895. *Malanea grandis* Rusby, Mem. Torrey Club 3[3]: 43. 1893.

Yungas, *Bang 418* (F, G, type collection). Without locality, *Bang 2863* (W, M).

Leaves petiolate, coriaceous, ovate or elliptic, 10–30 cm. long, acute, short-cuneate at the base, glabrous; panicles terminal, sessile, densely many-flowered, pubescent, 8–10 cm. long; calyx 1.5 mm. long, the lobes oblong-triangular, obtuse or acute; corolla 3 mm. long, the tube short; stamens exserted.

It is very doubtful whether this plant really belongs to the genus *Elaeagia*.

Elaeagia Mariae Wedd. Monogr. Cinch. 94. 1849.

Sandillani, 1,800–2,100 m., *Pearce* (K). Also in Peru.

A tree 18–24 m. high with resinous glabrous branches; stipules large, oblong, obtuse, deciduous; leaves oblong or oblong-lanceolate, acutish, shining, narrowed to the base, glabrous; panicles large, sessile, glabrous, many-flowered; calyx subtruncate; corolla yellowish green, 3 mm. long, barbate in the throat.

Elaeagia mollis Rusby, Descr. N. Sp. S. Amer. Pl. 130. 1920.

Yungas, at 1,800 m., *Rusby 2446* (F, type collection). San Carlos, Mapiri region, 800 m., *Buchtien 1400* (W).

Leaves petiolate, the blades oval, 12–18 cm. long, 6–10 cm. wide, acute at the base, soft-pubescent; flowers sessile, panicled; calyx 5-dentate.

Elaeagia obovata Rusby, Descr. N. Sp. S. Amer. Pl. 130. 1920.

Yungas, at 1,800 m., *Rusby 2447* (Y, type; photo. in F). Monterico, in forest, 900–1,200 m., *Pearce* (K; photo. in F).

A large tree with straight erect smooth trunk; leaves short-petiolate, obovate, 20–34 cm. long, 7–14 cm. wide, abruptly acuminate, acute at the base, puberulent beneath on the veins; panicles 12–17 cm. long, short-pedunculate, the flowers sessile; calyx 1.5 mm. long, the lobes very short and broad; corolla 3 mm. long, densely barbate within.

22. ARCYTOPHYLLUM Willd.

Arcytophyllum confertum (R. & P.), comb. nov. *Hedyotis conferta* R. & P. Fl. Peruv. 1: 57. *pl. 87, f. a.* 1799.

Near Sorata, in grassy places, 3,600 m., *Mandon 344* (G, K, S, Y). Above Tolapampa, 3,600 m., *Williams 853* (Y). Also in Peru.

Plants prostrate, woody, matted, the stems slender; leaves lance-linear, piliferous at the apex; flowers minute, white, terminal, solitary; fruit a small capsule.

TEINOSOLEN Hook. f. in Benth. & Hook.

Gen. Pl. 2: 61. 1873.

Of this genus the *Index Kewensis* (4: 1041. 1895) lists three species, *T. grandiflora* Hook. f., *T. macrosepala* Hook. f., and *T. Pearcei* Hook. f., all "in Herb. Hook.," and from Bolivia. So far as

I know, no species of this group ever has been formally described. The genus certainly is very close to *Arcytophyllum*, and probably is not generically distinct.

23. GONZALAGUNIA R. & P.

Gonzalagunia Whitei (Rusby) Standl. Field Mus. Bot. 4: 280. 1929. *Duggena Whitei* Rusby, Mem. N. Y. Bot. Gard. 7: 371. 1927.

Without locality, *Rusby 1294A* (Y, type; photo. in F). Rurrenabaque, 300 m., *White 2350* (W, Y); *Rusby 1294* (Y).

A shrub, the branches pubescent with divergent or reflexed hairs; leaves ovate, acuminate, obtuse at the base, pilose above, densely soft-pilose beneath, nearly sessile; flowers in long slender spikelike panicles; calyx lobes subulate; corolla tube 4–5 mm. long, strigose, the lobes nearly equaling the tube; fruit baccate.

24. ISERTIA Schreb.

Isertia reticulata Britton, Mem. Torrey Club 6: 46. 1896.

Between Guanai and Tipuani, *Bang 1358* (F, W, type collection). Apolo, *Williams 1563* (W). San Carlos, 750 m., *Buchtien 2128* (W). Mapiri, 750 m., *Rusby 1895* (F, W). San Carlos, Mapiri region, 750 m., *Buchtien 64* (F), *1394* (W).

A tree 6 m. high, the trunk 10 cm. in diameter; leaves large, petioled, obovate, short-acuminate, reticulate-veined, densely grayish-tomentose beneath, glabrous above or nearly so; flowers in short dense terminal thyrsoid panicles; corolla about 4 cm. long, tubular, with very short lobes, densely tomentose outside; fruit subglobose, juicy.

Buchtien reports that the fruit is edible and of good flavor.

25. COCCOCYPSELUM Sw.

Coccocypselum Condalia Pers. Syn. Pl. 1: 132. 1805. *Condalia repens* R. & P. Fl. Peruv. 1: 54. *pl. 84, f. a.* 1798, non *Coccocypselum repens* Sw. 1788. *Coccocypselum glabrum* Britton, Bull. Torrey Club 18: 108. 1891, non DC., 1830. *Coccocypselum Brittoni* Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907.

Yungas, 1,200 m., *Rusby 2479* (F, type collection of *C. glabrum*). Without locality, *Bang 2018* (F, W). San Carlos, 750 m., *Buchtien 1978* (W). Hacienda Simaco, 1,400 m., *Buchtien 5573* (W). San Antonio, 570 m., *Buchtien 1977* (W). Charopampa, 570 m., *Buchtien 1979* (W). San Carlos, 850 m., *Buchtien 1445* (F), *1444* (F), *1443* (F). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7499* (W). San Carlos, 950 m., *Buchtien 1446* (W). Also in Peru and Brazil.

A creeping or procumbent herb, the stems appressed-pilose or glabrate; leaves oblong-ovate, acute, sparsely appressed-pilose or

nearly glabrate, often pilose only close to the margins; inflorescence pedunculate, capitate, few-flowered; calyx lobes linear, acute; fruit a juicy blue berry.

Coccocypselum hirsutum Bartl. ex DC. Prodr. 4: 396. 1830.

San Carlos, near Mapiri, 750 m., *Buchtien 1758* in part (W); at 850 m., *Buchtien 1439* (F), *1438* (F), *1437* (W). Dolores, Dept. Santa Cruz, 450 m., *Steinbach 1876* (B). Ranging to Mexico.

Stems densely hirsute or hispid; leaves oval or broadly ovate, acutish, densely hirsute or hispid; flower heads few-flowered, long-pedunculate; calyx lobes linear, acute; corolla pale blue, 12–14 mm. long; berry dark blue, 6–10 mm. long, hirsute.

Coccocypselum lanceolatum (R. & P.) Pers. Syn. Pl. 1: 132. 1805. *Condalia lanceolata* R. & P. Fl. Peruv. 1: 54. 1798. *Coccocypselum canescens* Willd. ex Cham. & Schlecht. Linnaea 4: 139. 1829.

Polo-Polo, Nordyungas, 1,100 m., *Buchtien 232* (F), *5772* (W). Yungas, *Bang 270* (F, W). Coripati, Yungas, *Bang 2153* (F, W). Milluguaya, Nordyungas, 1,300 m., December, 1917, *Buchtien* (F). Locality uncertain, *Williams 451* (W). Mapiri, 750 m., *Rusby 1896* (W). Toldos bei Bermejo, 1,900 m., *Fiebrig 2368* (W). Apolo, *Williams 319* (W). Milluguaya, 1,400 m., *Buchtien 4391* (W), *4722* (W). Without locality, April 13–21, 1892, *Kuntze* (W). Hacienda Simaco, 1,400 m., *Buchtien 5572* (W). Hacienda Casana, Tipuani Valley, *Buchtien 7500* (F), *7501* (B, W). San Carlos, 950 m., *Buchtien 1440* (F). Paranani, Mapiri region, 1,000 m., *Buchtien 1441* (W). Widely distributed in South and Central America.

Leaves densely appressed-pilose; flower heads very dense and many-flowered; calyx lobes oblong, obtuse; corolla purplish blue, 5 mm. long; berries bright blue.

26. SABICEA Aubl.

Sabicea boliviensis Wernham, Monogr. Sabicea 37. 1914.

Yungas, *Bang 384* (F, W, M, type collection).

A scandent shrub, the young branches hirsute and tomentose, later glabrate; stipules large, broadly ovate, reflexed; leaves petiolate, elliptic-lanceolate, acuminate, at the base acute, rough-pilose above, pale-tomentose beneath; inflorescence lax or dense, hispid, pedunculate; calyx lobes linear-setaceous, 4 mm. long; corolla hispid, 9 mm. long; hypanthium hispid-pilose.

This is closely related to *S. cuneata*, and doubtfully distinct.

Sabicea brasiliensis Wernham, Monogr. Sabicea 51. 1914.

Buenavista, Santa Cruz, 500 m., *Steinbach 5234* (B, F). Mapiri, 750 m., *Rusby 1905* (F, W, M). Apolo, *Williams 173* (W). Charopampa, 570 m., *Buchtien 1961* (W), *1488* (W). Hacienda Simaco, 1,400 m., *Buchtien 5576* (W). Also in Brazil.

A large woody vine, the branches densely white-tomentose; leaves petiolate, elliptic or ovate, usually long-acuminate, rough-pubescent above, densely white-tomentose beneath; flowers densely tomentose, in dense sessile heads; calyx lobes triangular; corolla white, tomentose, the lobes ovate-lanceolate.

Some of the Bolivian collections have been distributed as *S. cinerea* Aubl. and *S. cana* Hook. This species is said to be known in Brazil as "sangue de Christo" and "sangue de Nosso Senhor."

Sabicea cuneata Rusby, Mem. Torrey Club 6: 47. 1896; Wernham, Monogr. Sabicea 37. *pl. 12.* 1914.

Between Guanai and Tipuani, *Bang 1380* (F, M, type collection).

A scandent shrub, the branches covered with an appressed white tomentum; stipules ovate; leaves petiolate, elliptic-oblong, acuminate, rough-pubescent above, densely white-tomentose beneath; inflorescence lax, about equaling the petiole, many-flowered, the flowers pedicellate, the pedicels strigose; hypanthium strigose and tomentose; calyx lobes narrowly linear, 5 mm. long; corolla strigose, 1 cm. long.

Sabicea erecta Rusby ex Wernham, Monogr. Sabicea 36. *pl. 12.* 1914. *S. acutissima* Rusby, Mem. N. Y. Bot. Gard. 7: 371. 1927.

Type from Tumapasa, at 540 m., *Williams 446*. Tumapasa, *Williams 590* (W). San Carlos, near Mapiri, in forest, *Buchtien 1486* (W). Rurrenabaque, 300 m., *Cárdenas 1185* (Y, type of *S. acutissima;* photo. in F).

A large scandent shrub, the branches tomentose and hirsute; stipules broadly ovate, reflexed, about 1 cm. long; leaves petiolate, elliptic or oblong-ovate, 5.5–15 cm. long, acuminate, hispidulous above, arachnoid-tomentose and pale beneath; inflorescence rather lax or dense, short-pedunculate, many-flowered, pilose; bracts 1 or 2, rounded, acute; calyx lobes lanceolate, 3–3.5 mm. long; corolla strigose, the tube 3–4 mm. long, the lobes lanceolate, 2 mm. long.

Sabicea Pearcei Wernham, Monogr. Sabicea 38. *pl. 3, f. 1.* 1914.

Type from woods about Moro, 900–1,200 m., *Pearce*. Also in Peru. The species has been attributed incorrectly to Colombia.

A woody vine, the branches densely hirsute; stipules broadly ovate, reflexed, about 1 cm. long; leaves petiolate, elliptic-lanceolate to elliptic-ovate, acuminate, acute to rounded at the base, hirsute; inflorescence lax, many-flowered, short-pedunculate or sessile, hirsute; bracts lanceolate; flowers pedicellate; calyx lobes oblong to linear-lanceolate, 4–5 mm. long or in age 7 mm. long, ciliate; corolla white, 1 cm. long, hispidulous.

Sabicea setiloba Wernham, Monogr. Sabicea 37. 1914.

Type from Santa Cruz, in woods, *Pearce*.

A scandent shrub 3–4.5 m. long, the branches shortly and densely ashy-villous; leaves elliptic, 9–11 cm. long, 4–4.5 cm. wide, narrowed

at each end, hispidulous above, beneath densely arachnoid-tomentose, the petioles 10–12 mm. long; inflorescence lax, 1.5 cm. long or less, spreading-pilose, the peduncle up to 5 mm. long, tomentose; calyx lobes subsetaceous, 3–4 mm. long; corolla strigose, scarcely 1 cm. long, the lobes minute; fruit sparsely pilose and arachnoid-tomentose.

Sabicea villosa R. & S. Syst. Veg. 5: 265. 1819. *S. hirsuta* HBK. Nov. Gen. & Sp. 3: 417. 1820.

Rurrenabaque, 300 m., *Cárdenas 1151* (W). Charopampa, in forest, 570 m., *Buchtien 1487* (W). San Carlos, 600 m., *Buchtien 1451* (F). Widely distributed in tropical America.

A large scandent shrub, the branches hirsute; stipules broad, reflexed; leaves elliptic-oblong or ovate, acuminate, hirsute; flowers sessile in small axillary sessile heads; calyx lobes linear-lanceolate; corolla strigose, white, the tube 5–6 mm. long; fruit purple, about 1 cm. long.

One of the specimens cited was distributed as *S. aspera* Aubl.

Sabicea villosa R. & S., var. **adpressa** (Wernham) Standl. Field Mus. Bot. 7: 52. 1930. *S. hirsuta* HBK., var. *adpressa* Wernham, Monogr. Sabicea 55. 1914.

Prov. Chapare, Dept. Cochabamba, 1,600 m., *Steinbach 9058* (B). Edge of forest, San Onufre, 1,600 m., *Steinbach 9417 bis* (B). San Carlos, Mapiri region, 800 m., *Buchtien 1452* (W). Distributed with the typical form.

Stems appressed-hispid, otherwise as in the type.

27. BERTIERA Aubl.

Bertiera guianensis Aubl. Pl. Guian. 180. *pl. 69.* 1775.

Tipuani to Guanai, *Bang 1712* (F, M, W). Locality uncertain, *Williams 405* (W). Charopampa, 570 m., *Buchtien 1947* (W). Guanai, 600 m., *Rusby 2118* (F, W). San Carlos, 600 m., *Buchtien 1230* (F). Widely distributed in tropical America.

A slender shrub; leaves short-petioled, ovate-oblong or ovate-lanceolate, acuminate, appressed-pilose, 9–15 cm. long; flowers small, white, in terminal panicles, secund along the branches; fruit a globose 10-costate berry 3.5 mm. long.

28. HAMELIA Jacq.

Hamelia lutea Rohr ex Smith in Rees, Cycl. 5: 117. 1811.

Rurrenabaque, in forest, 300 m., *Rusby 801* (Y). Widely distributed in tropical America.

A shrub; leaves opposite, elliptic, nearly glabrous; flowers deep yellow, the corolla short, abruptly expanded above.

Hamelia patens Jacq. Enum. Pl. Carib. 16. 1760. *H. erecta* Jacq., loc. cit.

Cochabamba, *Bang 1222* (F, M). Mapiri, 1,500 m., *Rusby 2105* (F). Charopampa, 570 m., *Buchtien 1626* (F). Widely distributed in tropical America.

A shrub 1–3 m. high; leaves mostly ternate, pubescent or tomentose beneath, often densely so; flowers secund, sessile or nearly so; corolla tubular, orange-red; berries purple or purplish black, juicy.

Hamelia pedicellata Wernham, Journ. Bot. 49: 212. 1911.

Huachi, head of the Beni River, 900 m., *White 457* (Y). Ranging to Colombia and Venezuela.

A shrub; leaves mostly quaternate, nearly glabrous; flowers chiefly pedicellate, the corolla orange-red, 1.5 cm. long; berries red or purple.

29. HOFFMANNIA Sw.

Hoffmannia latifolia (Bartl.) Kuntze, Rev. Gen. 1: 284. 1891. *Higginisia latifolia* Bartl. ex DC. Prodr. 4: 399. 1830. *Hoffmannia brachycarpa* Britton, Bull. Torrey Club 18: 108. 1891.

Near Yungas, 1,200 m., *Rusby 2522* (F, W, type collection of *H. brachycarpa*). Yungas, *Bang 336* (F, M, W). Without locality, *Bang 2559* (F, M, W). Antahuacana, 750 m., *Buchtien 4733* (W). Also in Peru.

A shrub; leaves short-petiolate, obovate to oblanceolate, 6–8 cm. wide, abruptly acuminate, long-attenuate to the base, ferruginous-villous beneath along the veins; inflorescence axillary, short-pedunculate, few-flowered.

Hoffmannia pallida Rusby, Mem. Torrey Club 3[3]: 44. 1893.

Yungas, *Bang 354* (F, M, W, type collection). San Juan, *Williams 201* (W). Without locality, *Bang 2004* (W), *2003* (W). Junction of the rivers Beni and Madre de Dios, *Rusby 2679* (Y).

A slender branched shrub, the young branchlets ferruginous-tomentose; leaves oblanceolate or oblanceolate-oblong, mostly 3–8 cm. long, acuminate, long-attenuate to the base, green and glabrous above, paler beneath and sparsely villosulous; inflorescences umbelliform, slender-pedunculate, few-flowered, the pedicels longer than the flowers; calyx lobes very short, triangular-subulate; corolla acute in bud, 5 mm. long, the lobes longer than the tube.

Hoffmannia Pearcei Rusby, Mem. Torrey Club 3[3]: 44. 1893.

Yungas, *Bang 498* (F, W, type collection). Okara, 2,250 m., *Tate 917* (Y).

A branched shrub, the branchlets sparsely ferruginous-tomentoes; leaves long-petiolate, oblong-obovate, 6–12 cm. long, acute or short-acuminate, long-tapering to the base, glabrous above or nearly so, beneath ferruginous-villosulous, at least along the veins; peduncles clustered, elongate, the few flowers umbellate, long-pedicellate; calyx lobes triangular-subulate; corolla acute in bud, 5 mm. long, sparsely villous, the lobes acute, much exceeding the tube.

30. POSOQUERIA Aubl.

Posoqueria latifolia (Rudge) R. & S. Syst. Veg. 5: 227. 1819. *Solena latifolia* Rudge, Pl. Guian. 1: 26. 1806.

Junction of the rivers Beni and Madre de Dios, *Rusby 2220* (F, M). Widely distributed in tropical America.

A glabrous shrub or small tree with thick, deep green leaves; flowers large and showy, white, in few-flowered dense terminal cymes; corolla tube very slender, 13–18 cm. long; fruit globose, fleshy, yellow, 4–5 cm. in diameter, filled with large hard seeds.

Called "assucena do mato" in Brazil.

31. TOCOYENA Aubl.

Tocoyena formosa (C. & S.) Schum. in Mart. Fl. Bras. 6[6]: 347. 1889. *Gardenia formosa* C. & S. Linnaea 4: 200. 1829.

On hillsides, Buena Vista, Santa Cruz, 450–500 m., *Steinbach 5212* (F, Y), *6730* (F). Brazil to the Guianas.

A shrub or small tree 3–4 m. high, unarmed; leaves thin, mostly obovate or elliptic, acuminate, densely velvety-pubescent; flowers perfect, clustered at the ends of the branches, short-pilose; corolla yellow or yellowish white, the very slender tube 12–15 cm. long, the lobes obovate-rhombic, 2–3.5 cm. long; fruit yellow, globose, as large as a small apple.

Known as "bicito," "bicito de la pampa," and "tutumillo."

32. RANDIA L.

Randia boliviana Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907.

Without locality, *Bang 1773* (W, B, G, type collection), *1776* (G, W). Above Sorata, 3,000 m., *Williams 1547* (W). Near Sorata, Cochipata, 2,600–3,000 m., *Mandon 345* (G, B, K, S, Y). Pelechuco, 2,700–3,000 m., June, 1865, *Pearce* (K). Comarapa, Dept. Santa Cruz, 2,800 m., *Steinbach 8349* (B).

A spiny shrub 2–2.5 m. high, sometimes a tree of 6 m.; leaves elliptic to obovate, 2–5 cm. long, rounded to acute at the apex, glabrous or nearly so; flowers perfect; corolla white, glabrous outside, 8 mm. long; fruit globose, 1.5 cm. in diameter.

The vernacular name "muko-muko" is reported by Steinbach.

Randia calycina Cham. Linnaea 9: 246. 1834. *Basanacantha calycina* Schum. in Mart. Fl. Bras. 6[6]: 375. 1889.

Forests of the Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 7232* (F). Urubo, Dept. Santa Cruz, 450 m., *Steinbach 7347* (F). Also in Ecuador and Brazil.

A spiny shrub with large, nearly glabrous leaves; flowers dioecious; calyx lobes obovate or oblanceolate, green; corolla white, glabrous, 2–3 cm. long.

Closely related to *R. spinosa*, of which *R. calycina* is probably only a form. In *R. spinosa* the calyx lobes are linear or subulate and short.

"Espino."

Randia formosa (Jacq.) Schum. in Mart. Fl. Bras. 6[6]: 342. 1889. *Mussaenda formosa* Jacq. Enum. Pl. Carib. 16. 1760. *Basanacantha macrocarpa* Rusby, Mem. N. Y. Bot. Gard. 7: 374. 1927.

Rurrenabaque, 300 m., *Cárdenas 1261* (Y, type of *B. macrocarpa;* photo. in F). Ranging to Brazil, Panama, and the West Indies.

An unarmed shrub; leaves mostly ovate or elliptic and 3–7 cm. long, puberulent or appressed-pilose beneath; flowers perfect, terminal, solitary, sessile; corolla white, the slender tube 5–10 cm. long; fruit oval, costate, 2–6 cm. long.

Randia spinosa (Jacq.) Karst. Fl. Columb. 2: 128. 1869. *Mussaenda spinosa* Jacq. Sel. Stirp. 70. 1763. *Gardenia armata* Sw. Prodr. 51. 1788. *R. armata* DC. Prodr. 4: 387. 1830. *Basanacantha spinosa* Schum. in Mart. Fl. Bras. 6[6]: 376. 1889. *R. oblanceolata* Rusby, Bull. N. Y. Bot. Gard. 8: 120. 1912. *B. mucronata* Rusby, Mem. N. Y. Bot. Gard. 7: 373. 1927. *B. erythropoda* Rusby, loc. cit. *B. mollis* Rusby, op. cit. 375. 1927.

Forests of the Río Surutú, Dept. Santa Cruz, 450 m., *Steinbach 6549* (F, B). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7265* (F), *6594* (F, B), *6567* (F, B), *7275* (F). Forests of Río Yapacani, Dept. Santa Cruz, 350 m., *Steinbach 7559* (F). Junction of rivers Beni and Madre de Dios, *Rusby 2157* (F, W). Tumapasa, *Williams 527* (W, Y). San Buena Ventura, *Williams 639* (W, Y). Río San Juan, *Williams 253* (W). Rurrenabaque, *Cárdenas 1759* (W, Y). Huachi, *White 1003* (Y, type of *B. erythropoda;* photo. in F). Rurrenabaque, *Rusby 1255* (Y, type of *B. mollis*). Comarapa, Dept. Santa Cruz, 2,800 m., *Steinbach 834* (F). Bopi River Valley, 900 m., *Rusby & White 395* (Y). Gorge of the Bopi River, 900 m., *Rusby 555* (Y, type of *B. mucronata;* photo. in F). San Buena Ventura, 420 m., *Williams 639* (Y), *617* (Y, type of *B. oblanceolata*). Rurrenabaque, 300 m., *White* (Y). Bosques del Río Palometillas, Dept. Santa Cruz, 400 m., *Steinbach 6475* (B). Montecitos del Piray, Dept. Santa Cruz, 450 m., *Steinbach 2825* (B). Widely distributed in tropical America.

A spiny shrub or small tree; leaves pubescent or nearly glabrous, acute or acuminate; flowers dioecious, usually clustered at the ends of the branches and pediceled; corolla white, glabrous, the tube 1.5–3 cm. long; fruit oval or subglobose, 2.5–3.5 cm. long.

"Crucecito del monte," "grano duro," "tinajerito," "espino blanco," "espino." In Brazil known by the names "fruta da cachorro," "limâo do mato," and "jasmino do mato." The flowers are fragrant.

The corolla of *Basanacantha mucronata* is described by Rusby as being pilose, with a tube 6 mm. long, but it is really glabrous, and the tube is 15 mm. long. The fruit described by Rusby is detached and evidently does not belong with the leaves and flowers. It is a drupe (rather than a berry, as in *Randia*), perhaps of the genus *Guettarda*.

33. GENIPA L.

Genipa americana L. Syst. Nat. ed. 10. 931. 1759.

San Buena Ventura, *Williams 543* (W). Widely distributed in tropical America.

A large or medium-sized tree; leaves large, obovate, short-petioled, glabrous; flowers yellowish white, 2–4.5 cm. long, in small terminal cymes; fruit globose, brownish, 6–7 cm. in diameter, the pulp filled with numerous large compressed seeds.

Genipa caruto HBK. Nov. Gen. & Sp. 3: 407. 1820. *G. americana* L., var. *caruto* Schum. in Mart. Fl. Bras. 6^6: 352. 1889.

Velasco, July, 1892, *Kuntze* (W). Prov. Sara, Dept. Santa Cruz, 450 m., *Steinbach 3152* (F). In forests, Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6634* (F), *7335* (F). Widely distributed in tropical America.

Similar to *G. americana*, but the leaves densely and softly pubescent beneath.

Called "bí." Flowers yellow or white; fruit as large as an orange, edible, with somewhat acid flavor; a tree of 8–10 m.

34. DUROIA L. f.

Duroia Steinbachii, sp. nov.—Ramuli graciles teretes ferrugineo-brunnei, novellis dense pilosis, internodiis brevibus; stipulae ovatae, 4–5 mm. longae, tenues, brunneae, acuminatae, extus pilosae, persistentes; folia opposita vel ad apices ramulorum verticillata (3–5), petiolo gracili 6–10 mm. longo dense piloso; lamina elliptica vel oblongo-elliptica, 6.5–11 cm. longa, 3–5.5 cm. lata, acuta vel breviter acuminata, acumine acutiusculo, basi acuta, membranacea, supra viridis, sparse setuloso-pilosa vel glabrata, nervis prominulis, subtus paullo pallidior, ad nervos albido-pilosa, costa gracili elevata, nervis lateralibus utroque latere c. 9, prominentibus, gracilibus, subarcuatis, angulo acuto adscendentibus, remote a margine conjunctis, nervulis prominulis arcte reticulatis; flores masculi ad apices ramulorum fasciculati, pauci, sessiles, bracteis lineari-lanceolatis 5 mm. longis extus pilosis; hypanthium nullum; calyx annuliformis 4–5 mm. latus, 2 mm. altus, truncatus, extus pilosulus, intus glaber; corolla extus dense albido-pilosa vel sericea, tubo 2 cm. longo, basi 4 mm. lato, superne angustato, intus glabro, fauce constricto, lobis 5 oblongis 8–10 mm. longis acuminatis, intus minutissime papillosis; antherae 4 mm. supra

basin tubi insertae, filiformes, 7 mm. longae, inclusae.—Bolivia: Buenavista, Prov. Sara, Dept. Santa Cruz, alt. 450 m., October 2, 1925, *José Steinbach 7265* (Herb. Field Mus. No. 573,474, type; duplicate in Herb. Stockholm).

Evidently related to *D. eriopila* L. f., of northern South America. In that species, as described, the leaves are opposite, the staminate inflorescence is many-flowered, and the calyx is 8–9 mm. long.

35. AMAIOUA Aubl.

Amaioua corymbosa HBK. Nov. Gen. & Sp. 3: 419. *pl. 294.* 1820.

San Carlos, region of Mapiri, 950 m., *Buchtien 1723* (B). Tipuani to Guanai, *Bang 1655* (F, W). Also in Peru, the Guianas, and Venezuela.

A shrub or sometimes a tall tree; leaves petiolate, oval, ovate-elliptic, or oblong-elliptic, short-acuminate, glabrous or appressed-pilose beneath on the nerves; flowers dioecious, the staminate in terminal corymbs; corolla white, 1 cm. long, sericeous outside; fruit baccate, oval or subglobose, 1.5 cm. long.

36. ALIBERTIA A. Rich.

Alibertia benensis, sp. nov.—Frutex 2.5 m. altus, ramulis gracilibus teretibus griseis vel ochraceis, novellis dense tomentellis, internodiis abbreviatis; stipulae late triangulares acutae 1–1.5 mm. longae velutino-pilosulae persistentes; folia breviter petiolata membranacea decidua opposita, petiolo gracili dense pilosulo 2–3 mm. longo; lamina parva late obovata, ovali-obovata vel subrotundata 1.7–3 cm. longa, 1–1.7 cm. lata, apice rotundata vel obtusa, interdum abrupte contracta et breviter obtuse producta, basi acuta vel obtusa, supra viridis, praesertim ad nervos parum prominulos pilosula, subtus pallidior, ubique satis dense pilis patentibus albidis pilosula, costa gracili prominente, nervis lateralibus utroque latere c. 6 gracilibus prominulis angulo lato adscendentibus fere rectis remote a margine conjunctis; flores masculi ad apices ramulorum fasciculati, vulgo c. 5, sessiles; calyx late campanulatus 1–1.5 mm. longus truncatus basi abrupte contractus dense minute pilosulus; corolla extus dense minuteque pilosula, tubo ochraceo 7 mm. longo supra sensim angustato fauce contracto, lobis 5 ovatis vel ellipticis c. 5 mm. longis abrupte acuminatis intus glabris vel obscure puberulis.—Bolivia: San José, between Trinidad and Santa Cruz, Dept. El Beni, alt. 300 m., September, 1926, *E. Werdermann 2580* (Herb. Berol., type).

Vernacular name, "crucecita." Easily distinguished from *A. Steinbachii* by the abundant pubescence of the leaves and flowers.

Alibertia Steinbachii Standl. Field Mus. Bot. 4: 287. 1929.

Forests of the campos region, Buenavista, Prov. Sara, Dept. Santa Cruz, 450 m., *Steinbach 6597* (F, type; S). Dept. Santa Cruz,

Steinbach 5219 (B). Cantón Buenavista, 450 m., *Steinbach 2224* (B). Monte del Río Palometillas, Dept. Santa Cruz, 550 m., *Steinbach 2812* (B).

A shrub 2–3 m. high; stipules triangular, acute; leaves petiolate, the blades elliptic to oblong-obovate, 2.5–4.5 cm. long, shortly obtuse-acuminate, puberulent beneath along the costa and barbate; staminate inflorescence terminal, capitate, short-pedunculate, 3–7-flowered; corolla minutely puberulent, the tube 7–8 mm. long, the lobes white, glabrous, 2.5–3 mm. long; fruit black, 1 cm. in diameter, sweet and edible.

"Nigua."

Alibertia tutumilla Rusby, Mem. N. Y. Bot. Gard. 7: 375. 1927.

Rurrenabaque, 300 m., *White 2354* (Y, type; photo. in F), *2344* (Y); *Rusby 799* (Y). Río Ibin, *White 2067* (W), *2068* (W). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7015* (F).

A tree 9–12 m. high, glabrous except on the corollas; leaves short-petiolate, lance-oblong or elliptic-oblong, 10–20 cm. long, up to 8 cm. wide, abruptly acuminate; pistillate flowers terminal, solitary, subsessile; corolla creamy white, grayish-puberulent, the tube 1 cm. long, the lobes 1 cm. long, ovate, acutish; fruit globose, 3 cm. in diameter.

Called "tutumilla" and "bicito." The sweet and edible pulp is said to be eaten commonly by the native people. Steinbach reports that the fruit is almost perfectly spherical, and that the pulp, full of small seeds, is of good flavor.

37. GUETTARDA L.

Guettarda boliviana Standl. Field Mus. Bot. 4: 289. 1929.

Cercado, Prov. Sara, Dept. Santa Cruz, 400 m., *Steinbach 7351* (F, type; M). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7355* (F).

Leaves petiolate, the blades oblong-elliptic or broadly elliptic, 5.5–13 cm. long, acute or abruptly acuminate, sparsely appressed-pilose above, pilose beneath with appressed or (along the nerves) spreading hairs; cymes dense, many-flowered, 2–4 cm. broad, long-pedunculate; calyx 1.5–2 mm. long; corolla densely grayish-sericeous, the tube 19 mm. long, the lobes 6 mm. long.

Guettarda Spruceana Muell. Arg. Flora 58: 449. 1875.

Tumapasa, *Williams 573* (W). Ixiamas, *Williams 293* (W). Near Lake Rogagua, 300 m., *Rusby 1428* (Y), *1691* (Y), *1368* (Y). Also in Brazil.

Branches tomentose; leaves petiolate, elliptic-obovate to ovate or broadly elliptic, 10–18 cm. long, 5–12 cm. wide, acute or short-acuminate, at the base obtuse to rounded, coriaceous, green and

nearly glabrous above, densely pale-tomentose beneath; flowers in small loose cymes; calyx truncate; corolla 2.5 cm. long, densely tomentose; fruit 6-celled, 7–9 mm. broad.

Guettarda Tournefortiopsis, nom. nov. *Tournefortiopsis reticulata* Rusby, Bull. N. Y. Bot. Gard. 4: 369. 1907, non *G. reticulata* Griseb. 1863.

Without locality, *Bang 2230* (W, type collection).

Branches densely tomentose; leaves petiolate, lance-oblong, 10–15 cm. long, 3–4 cm. wide, acuminate, at the base obtuse or acute, coriaceous, nearly glabrous and shining above, very rugose, beneath densely white-tomentose; peduncles short, bifid, the branches 2–4 cm. long, the flowers sessile, secund; calyx obtusely lobate; corolla densely tomentose, 7 mm. long; fruit 5 mm. long.

This plant is the type of Rusby's genus *Tournefortiopsis.* Wernham (Journ. Bot. 53: 15. 1915) states that "save for the opposite leaves and prominent interpetiolar stipules, this plant bears a near resemblance to a *Tournefortia.*" I do not find the resemblance a very impressive one, but there is a remarkable similarity between the Bolivian plant and the Peruvian *Guettarda hirsuta.* The corolla lobes of *Tournefortiopsis* are described as valvate rather than imbricate, but there is no apparent difference between its flowers and those of plants referred to well-known species of *Guettarda.* It seems imperative, therefore, to refer the plants described under *Tournefortiopsis* to *Guettarda,* where they fit quite naturally.

38. CHOMELIA Jacq.

Chomelia brevicornu Rusby, Bull. Torrey Club 52: 140. 1925.

Rurrenabaque, Prov. Beni, 300 m., *Rusby 1283* (Y, type; W), *2359* (B, Y). Tumapasa, *Williams 415* (W). Cataracts of the Bopi River, *Rusby 555* (Y).

A shrub or small tree 4 m. high, with white flowers; leaves ovate or elliptic, 6–9 cm. long; corolla nearly 2 cm. long.

Chomelia dimorpha Rusby, Bull. Torrey Club 52: 140. 1925.

Polo-Polo, near Coroico, Yungas, 1,100 m., *Buchtien 206* (F, type collection), *5769* (W); in 1912, *Buchtien* (K).

Leaves elliptic or oblong-ovate, 5–7 cm. long, acuminate, strigillose beneath; corolla tube 6 mm. long.

Chomelia multiflora Rusby, Bull. Torrey Club 52: 141. 1925.

Lake Rogagua, Prov. Beni, 300 m., *Rusby 1365* (Y, type). Río Palometillas, Prov. Sara, Dept. Santa Cruz, 1,100 m., *Steinbach 6784* (F, M). Buenavista, Dept. Santa Cruz, 450–500 m., *Steinbach 6681* (F, B, M, S, K), *5051* (F, B, Y), *5138* (F, B, Y).

A shrub or small tree 2–5 m. high; leaves ovate, elliptic, or oval, 2–5 cm. long, pilose beneath along the nerves with ascending hairs; corolla white, the tube 8 mm. long; fruit black.

"Espino," "espino blanco."

Chomelia unguis-cati Standl. Field Mus. Bot. 8: 172. 1930.

Junction of the rivers Beni and Madre de Dios, *Rusby 1878* (W, G). Also in eastern Peru.

A shrub, armed with stout curved spines; branchlets glabrous; leaves slender-petiolate, the blades oblong or lance-oblong, 15–20 cm. long, long-acuminate, narrowed to the base, glabrous above, sparsely strigillose beneath, pilose in the axils of the veins, lineolate between the veins; cymes few-flowered, long-pedunculate, dense, the flowers sessile or short-pedicellate; calyx lobes linear-subulate, 3 mm. long, glabrous.

39. ANISOMERIS Presl

Anisomeris albicaulis (Rusby) Standl. Field Mus. Bot. 4: 293. 1929. *Guettarda albicaulis* Rusby, Mem. Torrey Club 6: 47. 1896.

Between Tipuani and Guanai, *Bang 1636* (F, M, W; type collection). Guanai, *Rusby 2659* (F, L, Y).

Leaves elliptic, 4–7 cm. long, obtuse, pilosulous beneath; corolla tube 8 mm. long, tomentose outside.

Anisomeris apodantha Standl. Field Mus. Bot. 4: 293. 1929.

Río Surutú, Prov. Sara, Dept. Santa Cruz, alt. 400 m., *Steinbach 7263* (F, type; K).

Leaves slender-petiolate, elliptic, 12–15 cm. long or larger, glabrous above, strigillose beneath; flowers congested in the axils and at the nodes, the inflorescences and flowers sessile; calyx lobes linear-lanceolate; corolla appressed-pilose, the slender tube 17–20 mm. long, the lobes 4–5 mm. long.

Anisomeris boliviana (Standl.) Rusby, Bull. Torrey Club 52: 142. 1925. *Chomelia boliviana* Standl. Contr. U. S. Nat. Herb. 18: 135. 1916.

Yungas, *Bang 342* (F, M, type collection). Between Tipuani and Guanai, *Bang 1738* (M, W). Hacienda Simaco, 1,400 m., *Buchtien 5575* (W). Misiones Guarayos–Santa Cruz de la Sierra, Dept. Santa Cruz, 250–300 m., *Werdermann 2600* (B).

Leaves elliptic-oval to lance-elliptic, 4–9 cm. long, acute or acuminate, sericeous beneath along the nerves; corolla tube 12–20 mm. long.

Reported by Rusby (Mem. Torrey Club 3^3: 45. 1893) as *Chomelia tenuiflora* Benth.

Anisomeris rauwolfioides Standl. Field Mus. Bot. 4: 292. 1929.

Edge of forest, Río Palometillas, Prov. Sara, Dept. Santa Cruz, 400 m., *Steinbach 6768* (F, type; K, B, M, S).

A small tree 4 m. high; leaves short-petiolate, elliptic or oblong-elliptic, 3.5–5.5 cm. long, acute, obtuse, or even rounded at the apex, at the base obtuse or acute, glabrous above, barbate beneath in the axils of the veins; flowers cymose-capitate, the cymes 3–5-flowered, pedunculate, the flowers sessile; calyx lobes ovate-oblong, obtuse; corolla appressed-pilose, the tube 10–12 mm. long, the lobes 2–2.5 mm. long.

"Espino blanco."

40. MALANEA Aubl.

Malanea boliviana, sp. nov.—Ramuli graciles subteretes ferruginei dense cinereo-strigillosi, internodiis elongatis; stipulae deciduae ovato-oblongae 8 mm. longae acuminatae erectae dorso medio strigosae ciliatae; folia breviter petiolata opposita, petiolo gracili 4–8 mm. longo strigoso; lamina coriacea elliptico-oblonga 5–7.5 cm. longa, 2–3 cm. lata, acuminata, acumine acuto, basi acuta vel obtusa, supra viridis, in statu juvenili ad venas sparse strigosa, cito glabrata, costa venisque non elevatis, subtus fere concolor, praesertim ad venas sparse strigosa vel glabrata, costa gracili elevata, nervis lateralibus utroque latere c. 7 obliquis, angulo semirecto adscendentibus, gracilibus, prominentibus, leviter curvis, marginem fere attingentibus, nervulis obsoletis; inflorescentiae axillares 1 cm. longe pedunculatae dense multiflorae 3–4 cm. longae et 1–1.5 cm. latae, floribus sessilibus, inferioribus in spicas breves dispositis, superioribus in glomerulos parvos densos sessiles aggregatis, bracteis infimis subulatis 1–1.5 mm. longis, superioribus late ovatis hypanthio multo brevioribus; hypanthium 0.7 mm. longum late turbinatum glabrum, calyce late campanulato 0.5 mm. longo obscure lateque dentato sparse hispidulo vel fere glabro 1–1.2 mm. lato; corolla extus dense strigosa infundibuliformis, tubo crassiusculo 2.5 mm. longo supra sensim dilatato, lobis oblongis obtusis patentibus 1.8 mm. longis intus dense albido-barbatis; antherae breviter exsertae 1.2 mm. longae oblongae; stylus glaber 2 mm. longus.—Bolivia: San Carlos, region of Mapiri, alt. 800 m., January 17, 1927, *Otto Buchtien 1885* (Herb. Field Mus. No. 608,977, type; duplicate in B). San Miguel, Mapiri region, 800 m., *Buchtien 1428* (B, W). San Carlos, region of Mapiri, 850 m., *Buchtien 1494* (B).—Peru: Mishuyacu, near Iquitos, Dept. Loreto, in forest, 100 m., a liana with cream-colored flowers, in 1930, *Klug 917* (F).

The genus *Malanea* has not been recorded previously from Bolivia or Peru, although represented by several species in eastern and northern South America. *M. boliviana* is related to *M. gabrielensis* Muell. Arg., but the latter has much broader leaves with numerous veins.

41. CHIOCOCCA L.

Chiococca alba (L.) Hitchc. Rept. Mo. Bot. Gard. 4: 94. 1893. *Lonicera alba* L. Sp. Pl. 175. 1753. *C. racemosa* L. Syst. Nat. ed. 917. 1759. *C. brachiata* R. & P. Fl. Peruv. 2: 67. *pl. 219*. 1799.

Tarija, 1,500 m., *Fiebrig 2674* (W). Mapiri, *Bang 1507* (F, W). Locality uncertain, *Williams 278* (W). Antahuacana, 750 m., *Buchtien 2213* (F, W). Hacienda Simaco, 1,400 m., *Buchtien 5574* (W). Chailla, May, 1866, *Pearce* (K). Pata, 1,800 m., December, 1864, *Pearce* (K). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5118* (F, Y). Río Palometillas, Dept. Santa Cruz, 400 m., *Steinbach 6766* (F). Coripati, Yungas, *Bang 2146* (F). Dept. Santa Cruz, 450 m., *Steinbach 7343* (F). Widely distributed in tropical America.

A shrub, often much elongate and subscandent, the branches usually long and pendent; flowers pale yellow or white; fruit white, fleshy, strongly compressed.

42. COFFEA L.

Coffea arabica L. Sp. Pl. 172. 1753.

San Carlos, 750 m., October, 1907, *Buchtien* (M). Mapiri, *Bang 1560* (M).

Coffee (Spanish, *café*) is grown commonly in Bolivia at suitable elevations.

43. IXORA L.

Ixora Killipii Standl. Field Mus. Bot. 8: 174. 1930.

San Carlos, Mapiri region, 600 m., *Buchtien 1697* (F). Also in Peru and Colombia.

A shrub or small tree, the branchlets glabrous; leaves subsessile, oblong-elliptic, 8.5–15 cm. long, abruptly acuminate, obtuse or narrowly rounded at the base, glabrous; inflorescence cymose-paniculate, laxly few-flowered, the flowers slender-pedicellate; calyx segments triangular, acuminate; corolla greenish white, glabrous, the slender tube 2.5 cm. long, 1 mm. thick, the lobes linear-lanceolate, acute or acuminate, 1.5 cm. long.

Ixora peruviana (Spruce), comb. nov. *Cephalanthus peruvianus* Spruce ex Schum. in Mart. Fl. Bras. 6^6: 129. 1888.

Yapacani, 400 m., June, 1892, *Kuntze* (W). Bosque del Río Quimory, Dept. Santa Cruz, 400 m., *Steinbach 7332* (B). In forest, Río Palometillas, Dept. Santa Cruz, 400 m., *Steinbach 7611* (B). San Buena Ventura, 420 m., *Williams 627* (Y). Rurrenabaque, 300 m., *Rusby 1295* (Y). Pampas near Lake Rogagua, 300 m., *Cárdenas 1633* (Y). Also in Peru.

A shrub about 3 m. high; leaves petiolate, oblong to oblong-elliptic, acute or short-acuminate, 12–18 cm. long, glabrous or nearly so; flowers in small dense headlike cymes, these racemose-paniculate, with a strong jasmine-like odor; corolla white, 8–10 mm. long, the lobes reflexed; stamens reflexed; fruit red or reddish violet.

44. COUSSAREA Aubl.

Coussarea benensis Britton in herb., sp. nov.—Glabra; ramuli crassiusculi virides subteretes, internodiis elongatis; stipulae deciduae, non visae; folia opposita, petiolis validis 4–13 mm. longis supra

late sulcatis; limbus ellipticus vel elliptico-oblongus, 6.5–18 cm. longus, 2.7–9 cm. latus, apice abrupte breviterque acuminatus, acumine obtuso ad 1 cm. longo, basi acutus, crasse membranaceus, fere concolor, anguste marginatus, costa et nervis lateralibus supra prominulis, subtus prominentibus, gracilibus, nervis lateralibus utroque latere 5–7, angulo lato adscendentibus, arcuatis, prope marginem irregulariter arcuato-conjunctis, nervulis prominulis laxe reticulatis; inflorescentiae terminales capitiformes, plerumque 3-florae, sessiles vel ad 8 mm. longe pedunculatae, floribus sessilibus vel brevissime pedicellatis; hypanthium obovoideum 3.5 mm. longum; calyx 3–5 mm. longus, viridis, truncatus vel praesertim in flore centrali lobis 4 linearibus 4 mm. longis apice extrorsum uncinatis onustus; corolla 2.7 cm. longa, tubo 1 cm. longo, 3 mm. lato, lobis 4 lanceolato-linearibus apicem versus sensim attenuatis.—Bolivia: Junction of the rivers Beni and Madre de Dios, August, 1886, *H. H. Rusby 2402* (Herb. Field Mus. No. 164,433, type; duplicates in G, M, W, and Y).

Judging from the description of *C. longiflora* (Mart.) Muell. Arg., that Brazilian species must be closely related to the present plant, but in *C. longiflora* the tube and lobes of the corolla are about equal in length.

Coussarea hydrangeaefolia (Benth.) Benth. & Hook. ex Muell. Arg. in Mart. Fl. Bras. 6^5: 94. 1881. *Faramea hydrangeaefolia* Benth. Linnaea 23: 451. 1850.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6685* (F, M), *7254* (B), *3098* (B). Tumapasa, *Williams 470* (W), *554* (W). Also in Peru and Brazil.

A nearly glabrous shrub or small tree 2.5–6 m. high; stipules acute; leaves short-petiolate, oblong-ovate to rounded-ovate, sometimes 20 cm. long, shortly cuspidate-acuminate, usually obtuse to broadly rounded at the base; flowers white, in small ovoid panicles, nearly sessile; calyx truncate; corolla glabrous, 10 mm. long, the 4 lobes twice as long as the tube; ripe fruit yellow, 1 cm. in diameter.

"Matico." Steinbach reports that the leaves are used for making a beverage similar to mate or Paraguayan tea, which is reputed to have tonic properties.

Coussarea rudgeoides Rusby, Mem. Torrey Club 6: 48. 1896.

Between Tipuani and Guanai, *Bang 1666* (F, W, M, type collection). San Miguel, Mapiri region, 800 m., *Buchtien 1491* (W). San Carlos, Mapiri region, 850 m., *Buchtien 1492* (F).

Glabrous; stipules 3–4 mm. long, rounded at the apex; leaves nearly sessile, elliptic or oblong-ovate, 12–25 cm. long, 5–10 cm. wide, abruptly caudate-acuminate, abruptly acuminate at the base; flowers white, cymose-paniculate, terminal, the panicles 5–6 cm. long; calyx truncate, obscurely denticulate; corolla 12 mm. long, the lobes half as long as the tube.

Coussarea urophylla, sp. nov.—Omnino glabra; ramuli graciles subteretes fusco-olivacei, internodiis valde elongatis; stipulae erectae subpersistentes late ovatae vel rotundatae 4–6 mm. longae, 3–4 mm. longe rigide abrupteque mucronatae; folia breviter petiolata opposita, petiolo 7–12 mm. longo subtereti crasso; lamina subcoriacea elliptico-oblonga, 14–18.5 cm. longa, 4–8.5 cm. lata, apice obtusa vel rotundata et abrupte longeque caudata, acumine lineari 1.5–2 cm. longo obtuso, basi acuta vel interdum abrupte contracta et breviter angustata, supra in sicco flavo-viridis, costa venisque prominentibus, venulis prominulis, subtus paullo pallidior, costa crassiuscula elevata, nervis lateralibus utroque latere c. 13 prominentibus, gracilibus, irregularibus, obliquis, angulo lato abeuntibus, infimis fere perpendicularibus, obscure curvis, prope marginem conjunctis, venulis prominulis laxe reticulatis; inflorescentia terminalis sessilis vel brevissime pedunculata, saepe e basi trichotoma, cymoso-paniculata, 4–5 cm. longa et aequilata, laxe multiflora, ramis crassis adscendentibus vel divaricatis subteretibus, floribus subumbellatis vel in cymulas trifloras dispositis, sessilibus vel crasse 1–2 mm. longe pedicellatis, bracteis caducis; hypanthium late obovoideum 1.5 mm. longum, calyce latissime campanulato truncato vix 1 mm. longo, 2–3 mm. lato; corolla in alabastro 12–15 mm. longa obtusa, tubo crassiusculo 3 mm. lato, limbo c. 5 mm. longo.—Bolivia: San Carlos, region of Mapiri, alt. 850 m., November 25, 1926, *Otto Buchtien 1485* (Herb. Berol., type; photo. and fragm. in herb. Field Mus.; duplicate in U. S. Nat. Herb.).

45. FARAMEA Aubl.

Faramea anisocalyx Poepp. & Endl. Nov. Gen. & Sp. 3: 28. 1845.

Tipuani to Guanai, *Bang 1641* (F, M, W). Charopampa, 570 m., *Buchtien 1957* (W). San Carlos, 700 m., *Buchtien 1719* (F). Also in Peru.

A glabrous shrub 4 m. high; stipules truncate and aristate; leaves short-petiolate, oblong-oblanceolate or oblong-obovate, caudate-acuminate; bracts large and leaflike, "snow-white" or "blue," drying yellow; corolla blue.

Easily recognized by the large and handsomely colored bracts, of whose color collectors give widely different descriptions.

Faramea Bangii Rusby, Mem. Torrey Club 3^3: 45. 1893.

Yungas, *Bang 368* (F, M, W, type collection).

Stipules ovate-deltoid, aristate-acuminate; petioles 1–2 cm. long; leaf blades oblanceolate-oblong, 9–19 cm. long, 3–5.5 cm. wide, abruptly short-acuminate, acute at the base, coriaceous; panicles terminal, sessile, many-flowered; pedicels about 1 cm. long; hypanthium more than 2 mm. long; calyx shallowly 5-dentate; corolla 1.5 cm. long, the lobes slightly longer than the tube.

Faramea candelabrum Standl., sp. nov.—Glabra; ramuli graciles lutescenti-virides subteretes, internodiis 3–7 cm. longis; stipulae 3 mm. longae persistentes, in tubum viridem truncatum connatae; petioli graciles 10–14 mm. longi, supra profunde angusteque sulcati; limbus anguste oblongus vel anguste oblanceolato-oblongus, 12–17 cm. longus, 2–4.8 cm. latus, apice acutus vel acuminatus et longe caudato-acuminatus, acumine 1.5–2.5 cm. longo lineari obtuso, basi acutus vel longe cuneatimque attenuatus, crasse membranaceus, sublucidus, fere concolor, costa supra plana subtus prominente gracili, nervis lateralibus utroque latere 8–9, gracilibus, supra non conspicuis, subtus prominulis, angulo lato divergentibus, arcuatis, prope marginem arcuato-conjunctis, nervulis prominulis reticulatis, marginatus, margine saepe anguste revoluto; inflorescentiae cymoso-corymbosae terminales sessiles trichotomae, 6–8.5 cm. longae et aequilatae, laxe multiflorae, cymulis umbelliformibus 3–7-floris, pedicellis 3–6 mm. longis saepe curvis, bracteis minutis subulatis; hypanthium obconicum 1 mm. longum; calyx 1 mm. longus remote 4-denticulatus, dentibus triangularibus acuminatis; corolla in alabastro obtusa glabra, tubo 7 mm. longo, superne sensim ampliato, fauce fere 3 mm. lato, lobis 4 lanceolato-oblongis 6 mm. longis obtusis intus glabris; antherae subexsertae lineares 5 mm. longae obtusae.—Bolivia: Yungas, in 1890, *Miguel Bang 322* (Herb. Field Mus. No. 163,405, type; duplicates in W and M). Unduavi, alt. 2,400 m., *Rusby 1870* (W).

In general appearance this suggests the Bolivian *F. Bangii* Rusby, but in that the stipules are aristate-acuminate. The specimens were distributed as *F. salicifolia* Presl.

Faramea maynensis Spruce ex Benth. & Hook. Gen. Pl. 2: 121. 1873, nomen nudum; Rusby, Bull. N. Y. Bot. Gard. 4: 300. 1907. *F. benensis* Rusby, Mem. N. Y. Bot. Gard. 7: 379. 1927.

Mapiri, 750 m., *Rusby 2120* (F, M, W), *2626* (W). Tipuani to Guanai, *Bang 1684* (M, W). Tumapasa, *Williams 553* (W). Forests of Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6933* (F, M). San Carlos, Mapiri region, 850 m., *Buchtien 1750* (F). Buenavista, 500 m., *Steinbach 5477* (Y), *7930* (B). Yungas, 1,800 m., *Rusby 1869* (Y). Without locality, *Bang 2655* (Y). Type of *F. benensis* from Rurrenabaque, *Cárdenas 1773*. Also in Ecuador and Peru.

A glabrous shrub 1–3 m. high; stipules aristate-acuminate; leaves slender-petiolate, narrowly oblong, long-acuminate or caudate-acuminate, thin; flowers pedicellate, numerous, cymose-corymbose; calyx 4-denticulate; corolla glabrous, blue, 12–17 mm. long, the lobes equaling or shorter than the tube; fruit smooth, nearly 1.5 cm. broad.

The specimens seen are somewhat variable but apparently conspecific. *F. maynensis* may not be distinct from *F. salicifolia* Presl, to which some of the Bolivian specimens have been referred.

Faramea tenuifolia Rusby, Mem. N. Y. Bot. Gard. 7: 380. 1927.

Rurrenabaque, 300 m., *Cárdenas 2048* (Y, type; photo. in F). Forests of Río Surutú, Dept. Santa Cruz, *Steinbach 7278* (F, K, B, S).

A glabrous shrub; stipules rounded and abruptly aristate; leaves slender-petiolate, oblong or elliptic-oblong, 8–15 cm. long, caudate-acuminate; inflorescences terminal and axillary, umbellate or cymose-corymbose, pedunculate, the cymules 3–5-flowered, the flowers pedicellate; calyx truncate; corolla 23 mm. long, the lobes slightly shorter than the tube; fruit 6 mm. broad, obscurely obtuse-tuberculate.

The species is closely related to *F. occidentalis* (L.) A. Rich., differing in the shorter pedicels and proportionately longer corolla tube. The type is in fruit only. The Steinbach collection, which is in flower, I had considered to represent a distinct species, and it is not at all certain that it is properly referable to *F. tenuifolia*, but the leaves of the two collections are so similar that it is inadvisable to separate them at present.

46. GEOPHILA Don

Geophila herbacea (Jacq.) Schum. in E. & P. Nat. Pfl. 4^4: 119. 1891. *Psychotria herbacea* Jacq. Enum. Pl. Carib. 16. 1760.

San Buena Ventura, *Williams 614* (W). Charopampa, 570 m., *Buchtien 1980* (W), *1981* (W). Guanai, 600 m., *Rusby 2631* (F, W), *2615* (F). Mapiri, 1,500 m., *Rusby 2102* (F, G, W). Sarampiuni, Mapiri region, 500 m., *Buchtien 1429* (W). San Carlos, Mapiri region, 750 m., *Buchtien 1430* (W). Bosques de Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5226* (F). Río Yapacani, Dept. Santa Cruz, 450 m., *Steinbach 7496* (F). Widely distributed as a weed in tropical America.

A creeping herb with long-petioled, rounded or ovate, cordate leaves; flowers white, in small terminal pedunculate heads; fruits fleshy, red or black, 5 mm. long.

47. CEPHAELIS Sw.

Cephaelis tomentosa (Aubl.) Vahl, Eclog. Amer. 1: 19. 1796. *Tapogomea tomentosa* Aubl. Pl. Guian. 160. *pl. 61.* 1775. *Psychotria tomentosa* Muell. Arg. in Mart. Fl. Bras. 6^5: 370. 1881. *Uragoga tomentosa* Kuntze, Rev. Gen. 1: 301. 1891.

San Carlos, Mapiri, 750 m., *Buchtien 1952* (F), *28* (F, G). Polo-Polo, North Yungas, 1,100 m., October, 1912, *Buchtien* (M). Yungas, *Bang 535* (F, G, W). Mapiri, 750 m., *Rusby 853* (W), *854* (G), *855* (L). Guanai to Tipuani, *Bang 1469* (F, G, M). San Carlos, 850 m., *Buchtien 1447* (F), *1447a* (F). Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 935* (B). Ranging northward to Mexico.

A slender shrub, usually 1–1.5 m. high, copiously hirsute; leaves short-petiolate, lanceolate to ovate-elliptic, long-acuminate; flower heads pedunculate, the large showy bracts bright red; corollas yellow; fruits blue.

Cephaelis umbellata (R. & P.), comb. nov. *Coffea umbellata* R. & P. Fl. Peruv. 2: 64. *pl. 215, f. a.* 1799. *Cephaelis conephoroides* Rusby, Bull. N. Y. Bot. Gard. 4: 372. 1907.

Without locality, *Bang 2866* (F, W, G, M, type collection of *C. conephoroides*). Hacienda Simaco, 1,400 m., *Buchtien 5591* (W), *5592* (B, W). Yungas, *Bang 366* (F, G, M, W). Locality uncertain, *Williams 1614* (W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3954* (W). Moro, 900–1,200 m., *Pearce* (K). San Carlos, Mapiri region, *Buchtien 1454* (F, B). Also in Peru.

A glabrous shrub or tree, sometimes 5 m. high; stipules connate, 5–8 mm. long, rounded at the apex and bidentate; leaves coriaceous, petiolate, obovate-oblong to oval, 10–18 cm. long, 3–8 cm. wide, abruptly acuminate, at the base acute or obtuse; flower heads umbellate at the end of a long terminal peduncle, inflorescence violet, bracts 5–6 mm. long; calyx obsoletely 5-lobed; fruit subglobose, 6 mm. long.

Even casual examination of the descriptions of *Coffea umbellata* R. & P. and *C. subsessilis* R. & P. shows that the figures on plate 215 have been transposed and are cited incorrectly by the authors. The illustration of *C. umbellata* is figure *a*, not *b*, as cited by Ruiz and Pavón. This confusion seems to have escaped the notice of earlier writers.

48. PSYCHOTRIA L.

Psychotria alba R. & P. Fl. Peruv. 2: 58. *pl. 205, f. a.* 1799. *Mapouria alba* Muell. Arg. Flora 59: 458. 1876. *M. rigida* Rusby, Mem. N. Y. Bot. Gard. 7: 376. 1927.

Tumapasa, *Williams 566* (K, W). Hacienda Simaco, 1,400 m., *Buchtien 5589* (W). Sirupaya, South Yungas, in forest, 2,300 m., *Buchtien 575* (W, Y), *576* (W, Y). San Antonio, near Mapiri, 850 m., *Buchtien 1614* (F, W). Milluguaya, North Yungas, 1,300 m., *Buchtien 763* (W). Moro, Yungas, 600–900 m., January, 1866, *Pearce* (K). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5294* (B, Y). Canamina, 1,650 m., *Rusby 102* (K). Sarampiuni, region of Mapiri, 850 m., *Buchtien 1476* (B), *1462* (B). San Carlos, 850 m., *Buchtien 1470* (B), *1484* (B). Yapacani, June, 1892, *Kuntze* (B). Widely distributed in South America.

A nearly glabrous shrub 2–3 m. high; stipules large, brown, obtuse, caducous; leaves petiolate, elliptic-oblong to obovate, acute or acuminate, at the base acute, glabrous or minutely puberulent beneath on the veins; inflorescence terminal, pedunculate, paniculate, open, many-flowered, trichotomous or radiately branched, the bracts minute, deciduous; flowers short-pedicellate; calyx denticulate; corolla white, 4 mm. long, minutely puberulent or glabrous; fruit glabrous.

Psychotria axillaris Willd. Sp. Pl. 1: 962. 1797.

San Carlos, Mapiri region, 600 m., *Buchtien 1468* (F, B); at 750 m., *Buchtien 1942* (W). Extending northward to Trinidad and the Guianas; British Honduras.

A shrub about 2 m. high; stipules subulate, persistent, 2 mm. long; leaves petiolate, elliptic to oblong, 12–15 cm. long, acuminate, tapering to the base, glabrous or with minute scattered hairs beneath; inflorescences axillary, short-pedunculate, densely few-flowered, scarcely longer than the petioles, the flowers nearly sessile; calyx minutely 5-dentate; corolla white, barbate within; fruit black.

Psychotria Bangii Rusby, Mem. Torrey Club 3[3]: 47. 1893.

Yungas, *Bang 404* (G, M, type collection). Unduavi Valley, 2,000–2,600 m., *Bro. Julio 502* (W). Sirupaya, South Yungas, 2,300 m., *Buchtien 574* (W).

A shrub, the branches glabrous; stipules persistent, united into a short sheath, bifid, about 8 mm. long, the lobes linear-lanceolate, attenuate; leaves petiolate, elliptic-oblong or lance-oblong, 10–20 cm. long, 4–10 cm. wide, long-acuminate, at the base acute or acuminate, sparsely puberulent beneath along the nerves or glabrate; inflorescence terminal, pedunculate, many-flowered, paniculate, narrow, pubescent, the branches opposite, the bracts linear; flowers sessile; calyx teeth triangular; corolla pubescent, 5 mm. long, the lobes very short, rounded at the apex.

Psychotria boliviana, sp. nov.—Frutex 1–1.5 m. altus, ramulis gracilibus teretibus, vetustioribus ochraceis, novellis viridibus interdum subcompressis glabris, internodiis elongatis; stipulae erectae persistentes glabrae in vaginam 3–4 mm. longam truncatam vel brevissime 4-lobam connatae; folia breviter petiolata opposita, petiolo gracili vel crassiusculo 5–13 mm. longo glabro; lamina membranacea lanceolato-oblonga vel elliptico-oblonga, rarius anguste oblanceolato-oblonga, 10–20 cm. longa, 2.5–8.5 cm. lata, longe sensimque vel interdum abrupte acuminata, acumine angusto acuto vel obtuso, basin versus longe angustata vel interdum abrupte angustata et breviter decurrens, glabra, supra in sicco laete viridis, costa venisque ut venuli prominentibus vel prominulis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere c. 12 obliquis, angulo angusto vel lato adscendentibus, gracilibus, prominentibus, subarcuatis vel fere rectis, prope marginem conjunctis, nervulis prominulis laxe reticulatis; inflorescentia terminalis parva 2–3.5 cm. longe pedunculata, cymoso-paniculata, ovoidea, vulgo 3–4 cm. longa et fere aequilata, laxe multiflora, ramis basalibus oppositis vel verticillatis, patentibus vel adscendentibus, interdum subreflexis, brevibus, glabris vel sparse et minutissime puberulis, bracteis minutis vix 1 mm. longis triangularibus acuminatis mox deciduis, floribus subcapitato-congestis sessilibus; hypanthium late turbinatum glabrum 0.5–0.8 mm. longum, calyce late campanulato truncato glabro 0.6 mm. longo; corolla alba vel lutescens extus glabra 3 mm. longa in alabastro apice rotundata, tubo anguste campanulato in fauce dense albo-barbato, lobis 5 patentibus triangulari-oblongis obtusis tubo fere duplo brevioribus; fructus globosus glaber basi et apice rotundatus 5 mm. longus pyrenis 2 dorso obscure costatis facie interiore planis.—Bolivia: San

Carlos, region of Mapiri, alt. 850 m., November 3, 1926, *Otto Buchtien 1489* (Herb. Field Mus. No. 609,011, type). San Carlos, *Buchtien 1478* (W, B), *1502* (F), *1489* (B), *1516* (B). Mapiri, 500 m., *Buchtien 1473* (B); *Rusby 1883* (F). Tipuani to Guanai, *Bang 1693* (F), *1714* (F).

Some of the specimens have been referred to *Psychotria chionantha* (DC.) Britton, a species not at all closely related.

Psychotria brachiata Sw. Prodr. Veg. Ind. Occ. 45. 1788.

Sarampiuni, Mapiri region, 500 m., *Buchtien 1464* (B, W), *1655* (B). Widely distributed in tropical America.

A shrub with glabrous branches; stipules short, green, persistent, bilobate, the lobes rounded; leaves petiolate, oblong-obovate to oblong-elliptic, acuminate, acute to attenuate at the base, glabrous or nearly so; inflorescence terminal, pedunculate, paniculate, narrow, the branches short, divaricate, subtended by long narrow involute bracts, the flowers in dense bracted clusters; corolla white or yellow, 1 cm. long, pubescent; fruit glabrous, blue.

Psychotria Buchtieni (Winkl.), comb. nov. *Uragoga Buchtieni* Winkl. Repert. Sp. Nov. 8: 5. 1910.

San Antonio, near Mapiri, 850 m., *Buchtien 1608* (F, W, type collection; photo. of type, ex Herb. Berol., in F). Polo-Polo, North Yungas, 1,100 m., *Buchtien 295* (F, G), *4725* (W); October, 1912, *Buchtien* (M). Hacienda Simaco, 1,400 m., *Buchtien 5578* (W), *5577* (W), *5579* (W). San Carlos, near Mapiri, 750 m., *Buchtien 1945* (W); at 850 m., *Buchtien 1486a* (F), *1486b* (F), *1486c* (F), *1487* (F), *1486* (W), *1486d* (W), *1486e* (W), *1486f* (W). Santa Cruz, 1,500–1,800 m., December, 1864, *Pearce* (K). Hacienda Casana, Tipuani Valley, *Buchtien 7502* (F, B). Also in Peru.

A shrub 2–4 m. high, glabrous or nearly so except in the inflorescence; stipules subpersistent, short, bilobate, the lobes narrow, 1–2 mm. long; leaves short-petiolate, ovate-oblong or oblong-elliptic, long-acuminate, at the base obtuse or acute, sparsely short-pilose beneath along the nerves; inflorescence terminal, pedunculate, densely short-pilose, paniculate, radiately branched at the base, much shorter than the leaves, the flowers sessile, glomerate, the bracts foliaceous, as long as the flowers; calyx truncate, 5-denticulate; corolla pilosulous, 4–5 mm. long, densely barbate in the throat; fruit costate, 4 mm. long.

Psychotria Cardenasii, sp. nov.—Ramuli gracillimi teretes striati virides glabri, internodiis elongatis; stipulae persistentes in vaginam 1–1.5 mm. longam glabram truncatam connatae, vagina in lacinias 4 remotas subulatas 1 mm. longas erectas glabras desinente; folia petiolata opposita, petiolo gracili 3–7 mm. longo glabro; lamina firme membranacea, elliptica vel ovata, 4–9.5 cm. longa, 2–4 cm. lata, abrupte sensimve longiacuminata, acumine triangulari vel anguste triangulari attenuato acuto, basi acuta vel subabrupte contracta et decurrens, glabra, supra viridis, sublucida, nervis prominentibus, subtus pallida, costa gracili elevata, nervis lateralibus

utroque latere c. 9, gracillimis, prominentibus, arcuatis, angulo lato adscendentibus, prope marginem conjunctis, nervulis non elevatis arcte reticulatis; inflorescentia terminalis 1.2–3 cm. longe pedunculata cymosa densa c. 8-flora, pedunculo gracili erecto minute puberulo, ramis brevissimis erectis minute puberulis, bracteis minutis; hypanthium 0.8 mm. longum obovoideum sparse et minutissime puberulum; calyx glaber 0.6 mm. longus breviter 4-dentatus, dentibus latissime triangularibus acutiusculis vel obtusis; corolla alba hypocrateriformorpha extus glabra vel pruinoso-puberula, tubo cylindrico 2.5 mm. longo fauce non barbato, lobis 4 patentibus 1 mm. longis oblongis obtusis.—Bolivia: Bala, region of Rurrenabaque, alt. 300 m., November 28, 1921, *M. Cárdenas 1864* (Herb. N. Y. Bot. Gard., type; duplicates in K and B).

Psychotria carthaginensis Jacq. Enum. Pl. Carib. 16. 1760. *P. foveolata* R. & P. Fl. Peruv. 2: 59. *pl. 207, f. b.* 1799.

Uchimachi, Yungas, *Bang 2378* (F, G, M, W). Songo, *Bang 858* (F, G, M). Yungas, *Bang 355* (B, G, K, M, W). Junction of the rivers Beni and Madre de Dios, *Rusby 1877* (F, G, M, W). Mapiri, 750 m., *Rusby 1868* (W). Guanai, 600 m., *Rusby 1889* (W). Milluguaya, North Yungas, 1,300 m., *Buchtien 763* (F, W). Hacienda Simaco, 1,400 m., *Buchtien 5596* (W). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5086* (F, B, Y). Canamina, 1,650 m., *Rusby 102* (W). Yapacani, June, 1892, *Kuntze* (W). Yungas de San Mateo, Dept. Cochabamba, 2,800 m., *Steinbach 8422* (F, B, Y). Widely distributed in South America.

A nearly glabrous shrub; stipules large, brown, obovate, obtuse, caducous; leaves petiolate, lance-elliptic, acute or acuminate, at the base acute or attenuate, puberulent beneath, at least along the nerves, or glabrate; inflorescence terminal, paniculate, pedunculate, open, many-flowered, usually radiately branched at the base, the bracts minute, deciduous; flowers sessile; calyx obscurely denticulate; corolla white, minutely puberulent or glabrous, 4 mm. long; fruit red, 4 mm. long, glabrous.

Some of the Bolivian specimens have been referred to *Mapouria tristis* Muell. Arg., a closely related species.

Psychotria chlorotica Muell. Arg. Flora 59: 542. 1876; in Mart. Fl. Bras. 6^5: 314. *pl. 49.* 1881.

Tipuani to Guanai, *Bang 1649* (F, G, M, W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3917* (W, Y). Reported by Herzog (Med. Rijks Herb. 46: 26. 1922) from Cerro Amboró, at 1,300 m., *Herzog 317*. Also in Peru and Brazil.

A glabrous shrub; stipules united at the base, green, persistent, biparted, the lobes subulate, about 13 mm. long, or in the upper leaves lanceolate and longer; leaves short-petiolate, lanceolate to oblong-elliptic, acuminate, at the base acute or obtuse; inflorescence terminal, pedunculate, paniculate, small, dense, the branches opposite or the lower verticillate; bracts greenish white, equaling the

flowers; flowers sessile; calyx teeth unequal; corolla creamy white, glabrous, 8–9 mm. long, the lobes nearly as long as the tube; fruit subglobose, 4 mm. long, coarsely costate.

Psychotria costata (Rusby), comb. nov. *Mapouria costata* Rusby, Mem. N. Y. Bot. Gard. 7: 377. 1927.

Reyes, 300 m., *Rusby 1344* (Y, type; photo. in F).

A low shrub, finely and densely grayish-pubescent throughout; stipules broadly ovate, deciduous, obtuse, 1 cm. long; leaves sessile or nearly so, oval, 5–10 cm. long, 2.5–5 cm. wide, obtuse or acutish, at the base rounded or subcordate; inflorescence terminal, short-pedunculate, radiately branched from the base, about 3 cm. long and 5 cm. broad; calyx shortly 5-dentate; corolla nearly 3 mm. long, barbate in the throat, the lobes much longer than the tube.

Psychotria cuspidata Bredem. ex R. & S. Syst. Veg. 5: 192. 1819. *P. cornigera* Benth. in Hook. Journ. Bot. 3: 227. 1841.

In forest, Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7708* (F, M), *5307* (F, Y), *7222* (F, K, S). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3918* (B, W). Near Yungas, 1,200 m., *Rusby 1881* (G, W). Hacienda Simaco, 1,400 m., *Buchtien 5585* (B, W). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7506* (F, B), *7517* (B). Widely distributed in tropical America.

A glabrous shrub 1–1.5 m. high; stipules short, green, persistent, bicuspidate; leaves short-petiolate, lanceolate to elliptic-ovate, very long-acuminate, at the base obtuse or acute; inflorescence terminal, pedunculate, small, corymbose-paniculate, the few branches ascending or reflexed; calyx truncate; corolla white, glabrous, 5 mm. long; fruit white.

Psychotria emetica L. f. Suppl. Pl. 144. 1781.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7382* (F), *7216a* (F, M). Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 6812* (F, M). San Antonio, 850 m., *Buchtien 1932* (W). Ranging north to Central America.

Stems simple, suffrutescent, 30 cm. high or more, puberulent; stipules distinct, triangular-lanceolate, acuminate, deciduous; leaves petiolate, elliptic-oblong to oblong-lanceolate, acute or acuminate, at the base acute or attenuate, glabrous above, puberulent beneath; inflorescence axillary, about as long as the petioles, few-flowered, subcapitate; calyx obscurely dentate; corolla white or purplish, 5 mm. long, glabrous outside; fruit 6 mm. long.

"Ipecacuana falsa." The plant is one of the sources of the drug ipecac. Steinbach states that the roots have a strong and somewhat nauseating odor.

Psychotria falcata Rusby, Mem. Torrey Club 3^3: 47. 1893.

Yungas, *Bang 516* (B, G, M, W, type collection). San Antonio, near Mapiri, 850 m., *Buchtien 1615* (F, W). Yungas de San Mateo,

2,800 m., *Steinbach 8491* (F, B). San Carlos, Mapiri region, 800 m., *Buchtien 1490* (F, B). Tipuani, 1,400 m., *Buchtien 7516* (B, W). Also in Peru.

A nearly glabrous shrub 2–3 m. high; stipules persistent, 3–4 mm. long, united into a tube, very shortly bilobate, the lobes obtuse; leaves petiolate, ovate-oblong or elliptic-oblong, long-acuminate, at the base acute or abruptly acute, glabrous, paler beneath; inflorescence terminal, cymose-paniculate, pedunculate, narrow, open, many-flowered, the branches puberulent, the bracts minute; flowers mostly sessile; calyx acutely dentate; corolla 7 mm. long, glabrous, the lobes short, obtuse.

Psychotria Hartwegiana Standl. Field Mus. Bot. 4: 95. 1929. *Coffea marginata* Benth. Pl. Hartw. 93. 1845, non *P. marginata* Sw. 1788.

San Antonio, near Mapiri, 850 m., *Buchtien 939* (W). Also in Colombia.

Plants simple, suffrutescent, usually less than 1 m. high, the young stems puberulent or short-villous; stipules short, broadly ovate, caducous; leaves petiolate, lance-oblong to elliptic, acuminate, at the base acute to attenuate, large, puberulent or pilose beneath, at least along the veins; inflorescence axillary, long-pedunculate, corymbose-paniculate, the flowers glomerate, sessile or nearly so, the branches densely puberulent; corolla whitish, glabrous; fruit 4 mm. long.

Psychotria Herzogii S. Moore, Med. Rijks Herb. 46: 25. 1922.

Type from mountain forests, Cuñurú, at 700 m., *Herzog 309*. Near Cochabamba, *Bang 1184* (B, G, L, M, W). Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 5526* (F, B, Y). Also in Peru.

A glabrous shrub about 1 m. high; stipules biparted, 6–8 mm. long, persistent, the segments subulate, green; leaves nearly sessile, ovate-oblong, acuminate to obtuse, 2–4 cm. wide, obtuse or rounded at the base; inflorescence terminal, pedunculate, cymose-paniculate, dense, few-flowered, the bracts equaling the flowers, lanceolate to ovate-lanceolate, green or bluish; calyx obscurely denticulate; corolla white, nearly 1 cm. long, glabrous outside; fruit blue, didymous, glabrous, 5 mm. in diameter.

Psychotria involucrata Sw. Prodr. Veg. Ind. Occ. 45. 1788.

Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 5571* (F, B, Y). Guanai to Tipuani, *Bang 1713* (G, M, W). San Carlos, Mapiri region, 850 m., *Buchtien 1471* (F). Widely distributed in tropical America.

A nearly glabrous shrub; stipules short, green, persistent, biaristate; leaves petiolate, ovate or elliptic, acuminate, at the base abruptly contracted and decurrent, glabrous; inflorescence terminal, pedunculate, dense, rounded, few-flowered, 1–2 cm. long, the flowers sessile or nearly so, the outer bracts narrow, longer than the flowers, the rachis bluish purple; fruit globose, black, 4 mm. long.

Psychotria lassula Standl. Field Mus. Bot. 7: 100. 1930.

Polo-Polo, near Coroico, North Yungas, 1,100 m., *Buchtien 5767* (W, type). Also in Colombia and Peru.

A glabrous shrub, probably epiphytic; stipules connate into a truncate indurate sheath 2–3 mm. long, persistent; leaves short-petiolate, coriaceous, oblong, 4–7.5 cm. long, 1–2.5 cm. wide, obtuse or subacute, at the base acute or obtuse, the lateral veins about 4 on each side; inflorescence terminal, cymose-paniculate, pedunculate, laxly many-flowered, 4–7 cm. broad, the branches verticillate, the pedicels 1–4 mm. long; fruit red, globose, 4–5 mm. long.

Psychotria lupulina Benth. in Hook. Journ. Bot. 3: 230. 1841.

Río Beni, *Rusby 1872* (G, M, W). Also in Peru, Brazil, the Guianas, and Colombia.

A slender shrub, the branches glabrous; stipules green, persistent, truncate, shortly biaristate; leaves subsessile, ovate or elliptic, acuminate, rounded to acute at the base, glabrous; flowers in dense terminal pedunculate headlike cymes, the bracts large and foliaceous; peduncles pubescent; calyx minutely 5-dentate; corolla white, 10 mm. long.

The single Bolivian collection is noteworthy because of the curious upper leaves, which are subtruncate at the base and sometimes caudate-acuminate. The form may be worthy of nomenclatural recognition, but further material is necessary to establish its constancy.

Psychotria luxurians Rusby, Mem. Torrey Club 6: 50. 1896.

Between Tipuani and Guanai, *Bang 1741* (F, G, M, W, type collection). Charopampa, in forest, 570 m., *Buchtien 1632* (W). San Carlos, near Mapiri, 750 m., *Buchtien 1941* (W). San Antonio, near Mapiri, in forest, *Buchtien 1616* (F, W). San Carlos, 850 m., *Buchtien 1498* (B, F), *1457* (F). Reported from Peru, and in Ecuador.

Branches glabrous; stipules persistent, 6–7 mm. long, triangular, short-bifid at the apex; leaves slender-petiolate, oblong-elliptic, large, thin, long-acuminate, at the base acute, minutely puberulent along the nerves; inflorescence terminal, long-pedunculate, paniculate, very large, 10–20 cm. long, lax, many-flowered, the branches puberulent, the bracts linear, 1–1.5 cm. long; flowers sessile or pedicellate; calyx teeth acute; corolla 4 mm. long, glabrous outside, the short lobes acute; fruit 3–4 mm. long.

Psychotria macrophylla R. & P. Fl. Peruv. 2: 56. *pl. 202, f. a.* 1799.

Antahuacana, 750 m., *Buchtien 2227* (W, Y). Hacienda Simaco, 1,400 m., *Buchtien 7518* (B). San Carlos, 850 m., *Buchtien 1463* (B). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7513* (F). San Carlos, Mapiri region, 850 m., *Buchtien 1463* (B). Edge of forest,

San Onufre, 1,500 m., *Steinbach 9342* (B). Hacienda Casana, 1,400 m., *Buchtien 7518* (B). Ranging to southern Mexico.

Stems simple, suffrutescent, 1 m. high or less, glabrous or nearly so; stipules short, broad, apiculate, caducous; leaves large, petiolate, elliptic or elliptic-oblong, acuminate, acute to attenuate at the base, glabrous or nearly so; inflorescence axillary, long-pedunculate, paniculate, the branches often reflexed, the flowers sessile; calyx denticulate; corolla whitish, glabrous, 4–5 mm. long; fruit white or red, glabrous, 4–5 mm. long.

Psychotria mapirensis, sp. nov.—Ramuli crassiusculi subteretes densissime pilis ferrugineis intertextis villoso-pilosi, internodiis brevibus vel elongatis; stipulae caducae fere liberae tenues oblongo-ovatae acutae dense ferrugineo-pilosae; folia breviter petiolata opposita, petiolo crasso 6–20 mm. longo dense ferrugineo-piloso; lamina rigide membranacea lanceolato-oblonga vel oblanceolato-oblonga, 10–16 cm. longa, 3.5–6.5 cm. lata, sensim acuminata, basin versus longe sensimque angustata, fusco-viridis, satis dense pilis gracilibus fulvis hirsuta, ad costam densius hirsuta, costa venisque manifestis sed non vel vix prominulis, subtus paullo pallidior, dense pilis pallide brunneis villoso-pilosa, costa gracili elevata, nervis lateralibus utroque latere 8–12 obliquis, angulo angusto valde adscendentibus, gracilibus, prominentibus, subarcuatis, marginem fere attingentibus, venulis inconspicuis; inflorescentia terminalis magna 5 cm. longe pedunculata, basi foliis reductis fulcrata, late cymoso-paniculata, laxa, c. 17 cm. longa et 26 cm. lata, ramis radiato-verticillatis patentibus vel subadscendentibus crassiusculis elongatis densissime ferrugineo-villosis, bracteis paucis tenuibus late ovatis cuspidato-acuminatis plerumque 5–6 mm. longis extus villosis; flores in capitula globosa longe pedunculata dense multiflora c. 5 mm. diam. dispositi, arcte sessiles; hypanthium ut calyx dense fulvo-villosulum late turbinatum c. 1 mm. longum, calyce brevi c. 0.6 mm. longo subtruncato; corolla 3 mm. longa in alabastro obtusa, extus sparse villosula vel glabrata, tubo gracili brevissimo abrupte in faucem late campanulatam expanso, lobis 5 triangulari-oblongis obtusiusculis c. 1.5 mm. longis patentibus intus non barbatis; antherae subexsertae anguste oblongae 1.3 mm. longae.—Bolivia: San Carlos, region of Mapiri, alt. 600 m., December 31, 1926, *Otto Buchtien 1398* (Herb. Field Mus. No. 608,994, type; duplicate in B).

This plant is exactly intermediate between *P. rufescens* H. & B. and *P. villosa* R. & P. *P. rufescens* has a similar inflorescence, but very different pubescence on the upper surface of the leaves. In *P. villosa* the leaves have the same sort of pubescence, but the inflorescence is smaller and laxer, and the flowers are mostly pedicellate, never disposed in globose heads.

Psychotria marginata Sw. Prodr. Veg. Ind. Occ. 43. 1788.

Tipuani to Guanai, *Bang 1670* (F, M, W). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5294* (F; determination doubtful).

San Carlos, Mapiri region, 800 m., *Buchtien 1471* (F), *1484* (W). Ranging northward to Mexico and the West Indies.

A nearly glabrous shrub or small tree; stipules large, brown, entire, caducous; leaves short-petiolate, obovate to obovate-oblong, acute or acuminate, attenuate to the base, minutely puberulent or glabrous beneath; inflorescence terminal, long-pedunculate, open-paniculate, the bracts caducous, the flowers on pedicels 2–5 mm. long; calyx teeth short, obtuse; corolla yellowish white, 3 mm. long, glabrous outside; fruit globose, glabrous, 3–4 mm. long.

Psychotria microbotrys Ruiz ex Standl. Field Mus. Bot. 8: 204. 1930.

San Carlos, Mapiri region, 850 m., *Buchtien 1467* (B), *1466* (B, W). Also in Peru and Venezuela.

A shrub or small tree, glabrous except in the inflorescence; stipules persistent, 14–17 mm. long, bifid almost to the base, the segments lance-triangular, long-acuminate; leaves petiolate, membranaceous, elliptic-oblong to broadly elliptic, 14–24 cm. long, 7–11 cm. wide, acute at the base and apex; inflorescence terminal, pedunculate, broadly thyrsoid-paniculate, laxly many-flowered, 2–5 cm. long in anthesis, the branches spreading or broadly ascending, in fruit sometimes somewhat reflexed, glabrous or sparsely and minutely puberulent, the flowers sessile or very shortly pedicellate, sometimes secund; calyx lobes broadly rounded; corolla white, glabrous outside, 2.5 mm. long; fruit glabrous, subglobose, 3 mm. long.

Psychotria nana Krause, Verh. Bot. Ver. Brandenb. 50: 109. 1909.

Río Jovo, *White 2086* (Y). Also in Brazil.

A branched shrub 25–60 cm. high, the branchlets glabrous; stipules caducous; leaves herbaceous, obovate-lanceolate or narrowly obovate, 10–12 cm. long, 3–4 cm. wide, long-acuminate, cuneately narrowed to the base, glabrous; fruits globose, 5 mm. long, costate.

Psychotria niveo-barbata (Muell. Arg.) Britton, Bull. Torrey Club 18: 110. 1891. *Mapouria niveo-barbata* Muell. Arg. in Mart. Fl. Bras. 6^5: 401. 1881.

Yungas, *Bang 355* (F). Guanai, 600 m., *Rusby 2161* (G, W, referred by Britton, loc. cit., to *P. leiocarpa* Cham. & Schlecht.). Reported by Britton from Mapiri, *Rusby 1886*. Occurring also in Brazil.

A nearly glabrous shrub; stipules caducous, linguiform, obtuse; leaves petiolate, narrowly oblanceolate, long-acuminate, long-attenuate to the base, glabrous; inflorescence terminal, paniculate, pedunculate, lax, the bracts deciduous, the flowers slender-pedicellate; calyx repand-denticulate; corolla 4 mm. long, glabrous outside; fruit glabrous, 3 mm. long.

The identity of the specimens here cited is not altogether certain.

Psychotria Ottonis, sp. nov.—Frutex, ramulis vetustioribus crassiusculis subteretibus sordide olivaceis vel olivaceo-ochraceis, novellis in sicco fuscis glabris, internodiis brevibus; stipulae 5–6 mm. longae erectae persistentes glabrae in vaginam brevem connatae, vagina in lobos 4 approximatos late oblongo-ovatos obtusos vel acutiusculos desinente; folia petiolata opposita, petiolo gracili 10–15 mm. longo glabro; lamina firme membranacea elliptico-oblonga, obovata vel late elliptico-obovata, 9.5–14.5 cm. longa, 4–7 cm. lata, apice abrupte breviterque acuminata, interdum late rotundata et apiculata, acumine late triangulari obtuso, basin versus cuneatim longe vel brevius angustata, supra in sicco fusca, glabra, costa venisque prominentibus, subtus pallidior, secus costam ciliata, aliter glabra, costa gracili elevata, nervis lateralibus utroque latere c. 10 obliquis, angulo lato adscendentibus, prominentibus, gracillimis, arcuatis, juxta marginem conjunctis, venulis prominulis laxe reticulatis; inflorescentia terminalis sessilis vel 3–4 cm. longe pedunculata, cymoso-paniculata, ovoidea, sublaxe multiflora, 4–6 cm. longa et aequilata, ramis rigidis validis angulo lato adscendentibus alternis vel interdum fasciculatis pilis pallidis debilibus plus minusve dense pilosis, bracteis persistentibus plerumque 1–2 mm. longis late ovatis obtusis, floribus sessilibus cymoso-congestis vel subcapitatis; hypanthium latum c. 0.8 mm. longum sparse puberulum, calyce late campanulato glabrato 1.7 mm. longo truncato vel brevissime lateque lobulato; corolla alba extus dense villosula in alabastro obtusa c. 9 mm. longa, tubo crasso superne paullo dilatato, lobis oblongis obtusis adscendentibus intus non barbatis tubo brevioribus.—Bolivia: San Carlos, region of Mapiri, alt. 850 m., December 26, 1926, *Otto Buchtien 1415* (U. S. Nat. Herb., type; photo. in herb. Field Mus.). Also *No. 1515*, with the same data (Herb. Berol.).

Psychotria pallescens (Rusby), comb. nov. *Mapouria pallescens* Rusby, Mem. Torrey Club 6: 49. 1896.

Between Tipuani and Guanai, *Bang 1675* (F, G, M, type collection). Junction of the rivers Beni and Madre de Dios, *Rusby 1875* (W). Charopampa, 570 m., *Buchtien 1621* (F, W). San Miguel, Mapiri region, 900 m., *Buchtien 1742* (B). Sarampiuni, Mapiri region, 600 m., *Buchtien 1462* (W), *1476* (W). San Carlos, 850 m., *Buchtien 1470* (W). Also in Peru.

A glabrous shrub 2 m. high; stipules ovate, 7–8 mm. long, rounded at the apex, brown, caducous; leaves petiolate, oval to oblong-obovate, 8–15 cm. long, 4–10 cm. wide, rounded to acute at the apex, cuneate to obtuse at the base, pale; inflorescence terminal, pedunculate, cymose-paniculate, large and many-flowered, the bracts deciduous; flowers sessile; calyx entire or obscurely denticulate; corolla yellow, 8 mm. long, pruinose-puberulent, the lobes less than half as long as the tube.

Psychotria patens Sw. Prodr. Veg. Ind. Occ. 45. 1788. *P. flexuosa* Willd. Sp. Pl. 1: 966. 1798. *Uragoga patens* Kuntze, Rev. Gen. 2: 962. 1891.

Tipuani to Guanai, *Bang 1653* (F, G, M, W). Mapiri, 1,500 m., *Rusby 1884* (G, M, W). Ticunhuaya, 1,500 m., *Tate 1101* (Y). San Carlos, Mapiri region, 850 m., *Buchtien 1497* (W). Widely distributed in tropical America.

A slender glabrous shrub; stipules short, persistent, green, biaristate; leaves short-petiolate, lanceolate to oblong-ovate, long-acuminate, at the base rounded to acute; inflorescence terminal, paniculate, pedunculate, the very slender branches reflexed; calyx lobes triangular; corolla glabrous outside, about 7 mm. long; fruit white or pale blue, 3 mm. long.

Psychotria Pearcei, sp. nov.—Frutex 1–2-metralis, ramulis crassis subteretibus glabris ochraceis, internodiis 1–2 cm. longis; stipulae deciduae 9–13 mm. longae rotundato-ovatae obtusae ferrugineae glabrae erectae; folia breviter petiolata opposita, petiolo valido 7–12 mm. longo glabro vel sparse minuteque puberulo; lamina crasse membranacea oblanceolato-oblonga vel obovato-oblonga, 9–17 cm. longa, 4–6 cm. lata, acuta vel obtusa, basin versus longe angustata, basi ipsa cuneato-acuta, supra fusca glabra nervis non elevatis, subtus paullo pallidior, ad nervos ferrugineo-puberula vel villosula, costa gracili elevata, nervis lateralibus utroque latere c. 12, gracillimis, prominentibus, arcuatis, angulo lato adscendentibus, juxta marginem conjunctis, nervulis inconspicuis paucis laxe reticulatis; inflorescentia terminalis 2–4 cm. longe pedunculata, cymoso-paniculata, densissime multiflora, 4–5 cm. longa, 4.5–6.5 cm. lata, pedunculo crasso recto, ramis oppositis brevibus validis adscendentibus vel subdivaricatis dense ferrugineo-puberulis, floribus sessilibus ad apices ramulorum dense capitato-congestis, bracteis minutis et inconspicuis; hypanthium late turbinatum 1 mm. longum sparse et minutissime puberulum vel glabrum; calyx 1–1.2 mm. longus glaber vel glabratus, subtruncatus, remote et obsolete denticulatus; corolla alba extus glabra, tubo suburceolato 4 mm. longo ore subconstricto, lobis 4 oblongis obtusis intus minute puberulis; antherae semiexsertae.—Bolivia (?): Callcan, alt. 2,400 m., November, 1864, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.).

Psychotria pervicax, sp. nov.—Ramuli graciles teretes fusco-ferruginei glabri, internodiis brevibus vel elongatis; stipulae persistentes in vaginam 1 mm. longam truncatam glabram connatae, vagina in lobos 2 ovatos obtusos 1–1.5 mm. longos desinente; folia opposita, petiolo valido glabro 2–3 mm. longo; lamina coriacea glabra elliptico-oblonga, 6–11 cm. longa, 2.5–5 cm. lata, obtusa, acuta vel acuminata, basi obtusa vel acuta, lucida, costa nervisque utrinque prominentibus, nervis lateralibus utroque latere c. 10, angulo lato adscendentibus, gracilibus, arcuatis, prope marginem conjunctis, nervulis subtus vix prominulis laxe reticulatis; inflorescentia terminalis 4–7 cm. longe pedunculata cymoso-paniculata, 4–6 cm. longa et lata, dense multiflora, basi plerumque trichotoma, ramulis adscendentibus validis minute sparseque puberulis; bracteae subulatae 1–3 mm. longae; flores sessiles vel 1–2 mm. longe pedicellati; calyx vix

0.5 mm. longus, brevissime obtuseque denticulatus, glaber; fructus subglobosus 4 mm. longus sulcatus glaber, costis obtusis.—Bolivia: Hacienda Simaco, on the road to Tipuani, alt. 1,400 m., February, 1920, *Otto Buchtien 5589* (U. S. Nat. Herb. No. 1,398,056, type); January 25, 1920, *Buchtien 5595* (B, W); February, 1920, *Buchtien 5589b* (B).

Without corollas the generic position of the present plant is doubtful, and it is quite as likely to be a *Palicourea* as a *Psychotria*. At any rate, it has not been possible to refer the specimens to any species of either genus heretofore recorded from the region.

Psychotria pilosa R. & P. Fl. Peruv. 2: 60. *pl. 208, f. a.* 1799.

Hacienda Simaco, on the road to Tipuani, 1,400 m., *Buchtien 5594* (B, W). Sarampiuni, Mapiri region, 600 m., *Buchtien 1461* (B, W). Also in Peru.

A shrub, the branches densely hispid-pilose; stipules persistent, 1–1.5 cm. long, bifid almost to the middle, the lobes lanceolate, acuminate; leaves petiolate, oblong-lanceolate or narrowly elliptic-oblong, 10–16 cm. long, 3–4 cm. wide, long-acuminate, acute at the base, membranaceous, hispid on both surfaces; inflorescence terminal, pedunculate, paniculate, 3–4 cm. long, the branches hispid, the bracts ovate or lanceolate, 4–9 mm. long, the flowers congested, sessile; calyx lobes subulate; corolla white, 6 mm. long, glabrous outside, the lobes very short.

Psychotria racemosa (Aubl.) Willd. Sp. Pl. 1: 966. 1797. *Nonatelia racemosa* Aubl. Pl. Guian..1: 187. *pl. 72.* 1775.

Mapiri, 750 m., *Rusby 1867* (G), *1894* (Y). Buenavista, Dept. Santa Cruz, 400 m., *Steinbach 5559* (B, Y). Widely distributed in tropical America.

A shrub 2 m. high or less, the branches puberulent; stipules biparted, the segments linear-subulate, green, persistent; leaves short-petiolate, oblong-elliptic, acuminate, usually abruptly contracted at the base, nearly glabrous; inflorescence terminal, thyrsiform, short-pedunculate, the short branches minutely hirtellous, the flowers sessile; calyx lobes linear-lanceolate; corolla hirtellous; fruit 4–5-celled, sulcate, 4 mm. long.

This species may be recognized immediately by its usually 5-celled fruit, that of most species being 2-celled.

Psychotria ramiflora Rusby, Mem. N. Y. Bot. Gard. 7: 377. 1927.

Rurrenabaque, 300 m., November 26, 1921, *Cárdenas 1852* (Y, type; photo. in F).

Stipules connate, persistent, 4 mm. long, very shortly bilobate, the lobes rounded; branches glabrous; leaves short-petiolate, oblong-elliptic, 13–25 cm. long, 5–11 cm. wide, acuminate, acute at the base, glabrous; inflorescence terminal, long-pedunculate, puberulent,

broadly paniculate, 10–22 cm. long, very lax and many-flowered, the bracts subulate; flowers sessile, clustered or solitary along the branches; calyx 0.5 mm. long, shallowly dentate; corolla funnelform, 6–7 mm. long, puberulent, the lobes 1 mm. long.

Psychotria reticulata R. & P. Fl. Peruv. 2: 56. *pl. 212, f. b.* 1799. *Rudgea valida* Rusby, Mem. Torrey Club 6: 51. 1896.

Mapiri, *Bang 1564* (F, G, M, W; type collection of *R. valida*). Chimate, Mapiri region, 500 m., *Buchtien 1455* (F). Also in Peru.

Branches densely and shortly velvety-pilose; stipules persistent, united into a truncate sheath, the free lobes linear, nearly 1 cm. long; leaves short-petiolate, oblong-ovate to oblong-elliptic, abruptly acuminate, at the base obtuse, thick, rough above, densely velvety-pubescent beneath; inflorescence terminal, pedunculate, cymose-paniculate, pyramidal, the primary branches subtended by long narrow bracts, the cymes very dense, the flowers sessile; calyx teeth ovate, acute; corolla 6 mm. long, yellow, pilose.

Psychotria rhodothamna Standl. Field Mus. Bot. 8: 201. 1930.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 910* (B). Submonte de Buenavista, 450 m., *Steinbach 2320* (B). Bosque de Dolores, Dept. Santa Cruz, 450 m., *Steinbach 2838* (B). Pamparegion de Buenavista, 400 m., *Steinbach 3285* (B). Also in Peru.

A shrub 1–2 m. high, glabrous except in the inflorescence; stipules appressed, persistent, 2–3 mm. long, the short lobes ovate-triangular, obtuse; leaves petiolate, lance-oblong to oblong-elliptic, 9–19 cm. long, 3–8 cm. wide, cuspidate-acuminate, at the base acute or short-acuminate, the lateral veins about 8 pairs; inflorescence terminal, depressed-cymose, short-pedunculate, 1.5–3 cm. wide, densely many-flowered, the branches minutely puberulent or glabrous, fastigiate, tinged with red when dry, the flowers sessile or short-pedicellate; calyx truncate or obsoletely denticulate; corolla white, the tube 8–14 mm. long, the lobes 2.5–3 mm. long; fruit blue, didymous-globose, glabrous, 5–6 mm. broad.

Psychotria Ruizii, sp. nov.—Frutex fere glaber, ramulis gracilibus subteretibus viridibus vel olivaceis glabris, internodiis elongatis; stipulae erectae persistentes virides glabrae fere ad basin bifidae, laciniis lineari-attenuatis rigidis; folia breviter petiolata opposita, petiolo gracili interdum marginato 8–20 mm. longo glabro; lamina firme membranacea oblongo-ovata, lanceolato-oblonga vel elliptica, 10–19 cm. longa, 4–8 cm. lata, acuta, abrupte acuta vel longiacuminata, basi vulgo subito contracta et longe decurrens, glabra, supra luteo-viridis, costa venisque prominentibus, subtus paullo vel vix pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 7 angulo acuto adscendentibus obliquis arcuatis gracilibus prominentibus juxta marginem conjunctis, nervulis prominulis inconspicuis laxe reticulatis; inflorescentia terminalis capituliformis 1–2 cm. lata, 1–1.5 cm. longe pedunculata, erecta vel subrecurva, basi bracteata, pedunculo crasso sparse puberulo vel pilosulo vel fere glabro, bracteis

exterioribus viridibus rotundatis persistentibus c. 6 mm. longis et aequilatis glabris apice late rotundatis, interioribus interdum paullo longioribus venosis vel striatis, floribus paucis in capitula dense congestis sessilibus, capitulis paucis sessilibus vel interdum breviter pedunculatis; calyx profunde lobatus, laciniis triangulari-subulatis attenuatis; fructus glaber subglobosus c. 3.5 mm. longus et 4 mm. latus, pyrenis dorso 3-costatis facie interiore profunde anguste sulcatis.—Bolivia: Tipuani to Guanai, December, 1892, *Miguel Bang 1710* (Herb. Field Mus. No. 166,033, type). San Carlos, Mapiri region, 850 m., November 3, 1926, *Buchtien 1970* (F); January 23, 1927, *Buchtien 1465* (F).—Peru: Chicoplaya, *Ruiz* (photo. of specimen from Herb. Berol. in herb. Field Mus.).

Bolivian material of this species has been referred to *P. brachypoda* (Muell. Arg.) Britton, a quite different plant of Brazil. *Psychotria Ruizii* is related to *P. involucrata* Sw., but it has a quite different inflorescence and much broader bracts. The Ruiz specimen in the Berlin herbarium bears an unpublished name which, unfortunately, has been used already for a Brazilian species.

Psychotria scabrifolia Rusby, Descr. N. Sp. S. Amer. Pl. 137. 1920.

Mapiri, 750 m., *Rusby 2489* (G, W, type collection). Hacienda Simaco, 1,400 m., *Buchtien 5593* (B, W). Hacienda Casana, 1,400 m., *Buchtien 7515* (W).

A shrub 1–1.5 m. high, the branches densely hirsute; stipules green, persistent, united into a short sheath, this biaristate, the lobes about 1 cm. long; leaves short-petiolate, large, oblong-lanceolate, long-acuminate, at the base acute, densely hirsute; inflorescence terminal, cymose-corymbose, very dense, pedunculate or sessile, trichotomous, the flowers sessile, the bracts large and conspicuous, lance-linear, hirsute, longer than the calyx; calyx 5-parted, the lobes linear, 3 mm. long; corolla white, hirtellous, 1 cm. long, the tube very slender.

Psychotria Steinbachii, sp. nov.—Frutex 3-metralis, ramulis novellis viridibus teretibus in sicco ad nodos constrictis glabris vel nodis superioribus dense pilosis, internodiis 2–5 cm. longis; stipulae persistentes in vaginam 4–6 mm. longam dense fulvo-pilosam truncatam paullo incrassatam connatae, vagina in lacinias 4 lanceolato-triangulares 8 mm. longas dense pilosas acutas erectas distantes desinente; folia breviter petiolata opposita, petiolo c. 1.5 cm. longo crassiusculo dense breviterque piloso; lamina firme membranacea lanceolata vel lanceolato-oblonga, 18–21 cm. longa, 4.5–6 cm. lata, longissime angusteque attenuato-acuminata, acumine anguste obtuso, basin versus longe sensimque angustata vel attenuata, supra viridis, tantum ad costam pilosula vel puberula, costa venisque subimpressis, subtus paullo pallidior, ubique praesertim ad venas pilis patentibus pallidis mollibus satis dense pilosa, costa gracili elevata, nervis

lateralibus utroque latere c. 11 obliquis angulo angusto valde adscendentibus, gracilibus, prominentibus, marginem fere attingentibus, venulis prominulis laxe reticulatis; inflorescentia terminalis 12 mm. longe pedunculata thyrsoideo-paniculata c. 6 cm. longa et 4.5 cm. lata, cymis paucis racemose dispositis dense multifloris capituliformibus c. 1.5 cm. diam., usque ad 1 cm. longe pedunculatis, ramis crassis patentibus dense villoso-pilosis, bracteis infimis stipuliformibus et 6 mm. longis, superioribus lanceolatis vel oblongis viridibus flores fere aequantibus glabratis ciliatis, floribus sessilibus; hypanthium turbinatum 1.2 mm. longum sparse pilosum vel fere glabrum, calyce 0.6 mm. longo fere ad basin 5-fido, laciniis anguste triangularibus acutis ciliatis; corolla ochroleuca extus dense albido-villosa 6–7 mm. longa, lobis triangulari-oblongis subpatentibus obtusis intus glabris 2–2.5 mm. longis; antherae subexsertae 2.5 mm. longae anguste lineares.—Bolivia: Yungas de San Mateo, Comarapa, Dept. Santa Cruz, alt. 2,800 m., October 25, 1928, *José Steinbach 8540* (Herb. Berol., type; duplicate in herb. N. Y. Bot. Gard.; photo. in herb. Field Mus.).

Psychotria tipuanensis, sp. nov.—Ut videtur dense ramosa, ramulis gracilibus subteretibus in sicco ad nodos constrictis olivaceis vel subfuscis glabris, internodiis elongatis; stipulae persistentes erectae glabrae in vaginam truncatam plus minusve induratam 1.5–2.5 mm. longam connatae, vagina in lacinias 4 remotas linearisubulatas rigidas 2.5–5 mm. longas desinente; folia breviter petiolata opposita, petiolo gracili glabro 5–8 mm. longo; lamina tenuiter coriacea anguste lanceolato-oblonga 7–11 cm. longa, 1.5–2.5 cm. lata, longe attenuato-acuminata, acumine angusto, basin versus longe sensimque attenuata, glabra, supra laete viridis, costa venisque non elevatis, subtus pallidior, costa crassiuscula elevata, nervis lateralibus utroque latere c. 16, aliis tenuioribus et brevioribus interjectis, angulo fere recto abeuntibus, gracilibus, prominentibus, valde arcuatis, in marginem desinentibus, nervulis prominulis laxe reticulatis; inflorescentia terminalis sessilis vel 1 cm. longe pedunculata cymoso-paniculata laxe multiflora 5–8 cm. longa, 4.5–12 cm. lata, basi vulgo trichotoma, ramis oppositis basi bracteatis patentibus vel late adscendentibus sparse puberulis, bracteis linearibus viridibus usque ad 8 mm. longis, ceteris brevioribus, floribus in cymulas parvas densas dispositis, sessilibus vel brevissime pedicellatis; hypanthium 1 mm. longum turbinatum glabrum vel obscure sparseque puberulum, calyce 0.5 mm. longo minute acuteque dentato; corolla 4 mm. longa extus glabra vel sparse minuteque puberula, in alabastro apice subdepressa et obscure 5-tuberculata, tubo crassiusculo supra dilatato, lobis late ovatis obtusis 1 mm. longis suberectis intus non barbatis; bacca ovali-globosa 4.5 mm. longa glabra basi et apice rotundata, pyrenis 2 dorso obtuse costatis, facie interiore planis et angustissime longitrorsum sulcatis.—Bolivia: Between Tipuani and Guanai, December, 1892, *Miguel Bang 1727* (Herb. N. Y. Bot. Gard., type; duplicate in Herb. Berol.).

Psychotria tristis Winkl. Repert. Sp. Nov. 7: 249. 1909.

In forest, San Antonio, near Mapiri, 850 m., *Buchtien 1613* (W, type collection). Unduavi, North Yungas, 3,300 m., *Buchtien 674* (F, W); *Julio 333* (W). Camarapa, Dept. Santa Cruz, 2,800 m., *Steinbach 8491* (Y).

A shrub 2 m. high, the branches puberulent; stipules green, persistent, short-connate, 7–10 mm. long, bilobate, truncate between the setaceous lobes; leaves short-petiolate, elliptic-oblong, long-acuminate, attenuate to the base, thin, paler and puberulent beneath; inflorescence terminal, pedunculate, paniculate, narrow, dense, many-flowered, puberulent, the bracts linear, up to 6 mm. long, inconspicuous; flowers mostly sessile; calyx teeth ovate-triangular, acute; corolla yellow, minutely puberulent or glabrate, 5 mm. long; fruit coarsely costate, 5 mm. long.

Psychotria trivialis Rusby, Mem. Torrey Club 6: 50. 1896.

Espíritu Santo, *Bang 1186* (B, G, M, type collection). In thin forest, Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5569* (F, Y), *6870* (F, M), *7117* (F, B, K, M, S), *5173* (F, B, Y). Bosques de Buenavista, 450 m., *Steinbach 3325* (B). Mapiri, 550 m., *Buchtien 1472* (F, B). Also in Peru.

A glabrous shrub or small tree 3–4 m. high; stipules ovate-triangular, 2–3 mm. long, acute, caducous; leaves petiolate, oblong-oblanceolate or obovate-oblong, small, long-acuminate, long-attenuate to the base; inflorescence terminal, pedunculate, paniculate, many-flowered, lax, green, the bracts short, triangular-subulate, persistent; flowers slender-pedicellate; calyx acutely dentate; corolla scarcely 3 mm. long, yellow, glabrous, the lobes nearly as long as the tube; fruit red, globose, 3 mm. long.

Psychotria viridis R. & P. Fl. Peruv. 2: 61. *pl. 210, f. b.* 1799.

Guanai, 600 m., *Rusby 2515* (F, W). Santa Cruz, 450 m., *Steinbach 7495* (F, B, K, S). Ranging north to Central America and Cuba.

A glabrous shrub or small tree; stipules large, acuminate, thin, brown, caducous; leaves short-petiolate, obovate or oblong-obovate, acute or acuminate, cuneate-attenuate to the base; inflorescence terminal, pedunculate, spicate-paniculate, the flowers sessile in distant glomerules; corolla greenish white; fruit red.

Psychotria yungasensis Rusby, Mem. Torrey Club 3^3: 46. 1893.

Yungas, *Bang 597* (B, G, M, type collection), *598* (G, M, W). Quichara, 2,100–2,400 m., November, 1864, *Pearce* (K). Rusby reports also *Rusby 1865*.

A nearly glabrous shrub; stipules persistent, green, united into a short sheath, short-bifid, the lobes triangular-subulate; leaves petiolate, ovate to ovate-oblong, large, thin, acuminate, at the base acute or abruptly acute, sparsely pubescent beneath along the costa or glabrate; inflorescence terminal or becoming lateral, long-peduncu-

late, corymbiform-paniculate, the branches ascending, sparsely pubescent, many-flowered, the bracts minute; flowers partly sessile and partly on stout pedicels, often secund; calyx denticulate; corolla pubescent, 7 mm. long, the lobes about half as long as the tube; fruit subglobose, nearly smooth, 4–5 mm. broad.

49. PALICOUREA R. & P.

Palicourea amethystina (R. & P.) DC. Prodr. 4: 527. 1830. *Psychotria amethystina* R. & P. Fl. Peruv. 2: 57. *pl. 203, f. b.* 1799.

Coroico, 1,800–2,100 m., February, 1866, *Pearce* (K). Santa Cruz, 1,800–2,100 m., December, 1864, *Pearce* (K). Also in Peru.

A shrub 2–3 m. high, the young branches villosulous, soon glabrate; stipule sheath loose, 5–8 mm. long, the lobes narrowly triangular, shorter than the sheath; leaves short-petiolate, opposite, elliptic-oblong, 8–16 cm. long, acuminate, thick, short-villous or pilose beneath on the nerves; panicles pedunculate, pyramidal, many-flowered, 8–16 cm. long, the branches spreading, hirtellous or glabrate, the bracts subulate, inconspicuous; flowers short-pedicellate; calyx lobes minute, obtuse; corolla blue or purplish, tubular, glabrous, 8–9 mm. long; fruit oval, purple.

Palicourea attenuata Rusby, Bull. N. Y. Bot. Gard. 4: 371. 1907. *Psychotria salicifolia* Rusby, Descr. N. Sp. S. Amer. Pl. 140. 1920, non HBK. 1820.

Without locality, *Bang 2017* (W, type collection). San Antonio, near Mapiri, in forest, 850 m., *Buchtien 1611* (F, W). Without locality, "probably from near Cochabamba," *Bang* (Y, type of *P. salicifolia;* photo. in F). Pararani, Mapiri region, 1,000 m., *Buchtien 1459* (B, W). Also in Peru.

A shrub 2–3 m. high, the branches glabrous; stipule sheath 2–3 mm. long, truncate, the lobes very distant, triangular, as long as the sheath; leaves short-petiolate, narrowly lance-oblong, 10–30 cm. long, 3–7 cm. wide, long-acuminate, at the base acute, thick, glabrous; panicles thyrsoid, pedunculate, puberulent, narrow, 6–9 cm. long, dense, many-flowered, the branches spreading or even reflexed, the bracts minute; flowers sessile; calyx teeth minute and obscure; corolla 5 mm. long, orange-yellow, glabrous; fruit didymous-globose, 4 mm. long, nearly smooth.

Palicourea Buchtienii, sp. nov.—Ramuli subteretes graciles dense hirtelli, vetustioribus ochraceis, internodiis brevibus vel elongatis; stipulae ovatae, breviter connatae, 3–8 mm. longae, adpressae, persistentes, ad medium vel brevius bifidae, dense pilosulae vel glabratae, lobis linearibus attenuatis fere contiguis; folia opposita, petiolo gracili 6–10 mm. longo dense pilosulo; lamina ellipticooblonga, 4–10.5 cm. longa, 1.5–3.8 cm. lata, longe angusteque acuminata, rarius breviter acuminata, basi acuta vel abrupte contracta, crasse papyracea, supra viridis, dense, minute et molliter puberula, nervis inconspicuis, subtus pallidior, undique dense molliterque

puberula, costa gracili elevata, nervis lateralibus utroque latere c. 12, gracilibus, prominentibus, angulo lato adscendentibus, prope marginem conjunctis, nervulis prominulis; inflorescentia 1–5 cm. longe pedunculata, late paniculata, corymbiformis, 2–3.5 cm. longa, 3–5.5 cm. lata, dense multiflora, ramis divaricatis vel adscendentibus dense hirtellis; bracteae lineari-attenuatae 3–6 mm. longae hirtellae; flores conferti vel sparsi, sessiles vel 1–3 mm. longe pedicellati; hypanthium late turbinatum fere 1 mm. longum dense hirtellum; calyx fere 1 mm. longus hirtellus 5-lobus, lobis late triangularibus acutis; corolla tubulosa 12 mm. longa extus sparse hirtella, tubo gracili basi obscure ampliato, fauce 2 mm. lato, lobis triangularibus acutis 1 mm. longis; antherae semiexsertae; fructus ovoideo-globosus hirtellus 4 mm. longus calyce persistente coronatus.—Bolivia: Yungas, in 1890, *Miguel Bang 495* (Herb. Field Mus. No. 162,391, type; duplicates in G, M, W). Hacienda Simaco, on the road to Tipuani, 1,400 m., Jan. 30, 1920, *Buchtien 5588* (W, B).

This plant has been reported from Bolivia by Rusby (Mem. Torrey Club 3^3: 46. 1893) as *Psychotria Marcgravii* Spreng., but that species is described as having a much longer corolla, besides differing in other details.

Palicourea cornifolia, sp. nov.—Frutex 1–2-metralis, ramulis gracilibus teretibus, vetustioribus laevibus vel inconspicue rimosis ochraceis, novellis viridibus minutissime puberulis, internodiis plerumque 2–3.5 cm. longis; stipulae persistentes virides breviter connatae ovatae, 3–4 mm. longae, sparse puberulae vel glabratae, apice breviter bifidae, laciniis approximatis lanceolatis 1.5–2 mm. longis acutis; folia opposita, petiolo gracili 5–9 mm. longo minute puberulo; lamina subcoriacea, elliptica vel elliptico-oblonga, 5–6 cm. longa, 1.7–2.5 cm. lata, abrupte sensimve acuminata, acumine angusto acutiusculo, basi acuta, supra luteo-viridis, glabra, costa prominente, nervis non elevatis, subtus pallidior, praesertim ad nervos scaberula, costa gracili elevata, nervis lateralibus utroque latere c. 10, gracilibus, prominentibus, angulo lato adscendentibus, valde arcuatis, prope marginem conjunctis; inflorescentia terminalis 2–4 cm. longe pedunculata, late cymoso-corymbosa, laxe multiflora, 4–6 cm. longa et aequilata, basi trichotoma, interdum basi foliaceo-bracteata, ramis angulo lato vel angusto adscendentibus, pallidis, puberulis, gracilibus, floribus pedicellatis vel rarius sessilibus, pedicellis 2–4 mm. longis puberulis, bracteis linearibus vel subulatis plerumque 2–7 mm. longis sparse puberulis; hypanthium obovoideum 1 mm. longum minute puberulum; calyx 0.8–1 mm. longus minutissime puberulus, lobis minutis ovato-triangularibus acutis vel subobtusis; corolla lutea gracilis 14 mm. longa, extus sparse et minute puberula vel fere glabra, tubo basi paullo ampliato, superne sensim dilatato, ore 2.5 mm. lato, lobis triangulari-oblongis 2 mm. longis acutiusculis; antherae semiexsertae.—Bolivia: Woods above Coroico, alt. 1,800–2,100 m., February, 1866, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.). In forest, Incachaca, Dept. Cocha-

bamba, 2,200 m., January, 1929, *Steinbach 8907* (B); a shrub 1.5 m. high, the inflorescence yellow, the corolla white; *Steinbach 8908* (B). Incachaca, 2,500 m., October, 1921, *Steinbach 5807* (B); a shrub 1 m. high.

A plant of distinctive appearance because of the small leaves and pale, broad, laxly flowered inflorescence.

Palicourea crocea (Sw.) R. & S. Syst. Veg. 5: 193. 1819. *Psychotria crocea* Sw. Prodr. Veg. Ind. Occ. 44. 1788.

Ixiamas, *Williams 270* (W). Widely distributed in tropical America.

A nearly glabrous shrub or small tree; stipules 3–5 mm. long, the lobes short, subulate; leaves short-petiolate, elliptic-oblong or ovate-oblong, medium-sized, acuminate, at the base acute or obtuse; panicles pedunculate or sessile, pyramidal, open, many-flowered, the branches ascending or spreading, glabrous or puberulent, the bracts minute; flowers slender-pedicellate; calyx lobes minute, ovate or rounded; corolla red or orange, 8–12 mm. long, tubular, glabrous; fruit 4–5 mm. long.

Palicourea exiguiflora, sp. nov.—Frutex 1–2-metralis, ramulis gracilibus subteretibus glabris, internodiis 1.5–5.5 cm. longis; stipulae persistentes virides in vaginam latam glabram truncatam 5–6 mm. longam connatae, vagina in lacinias 4 approximatas erectas 6–7 mm. longas semiovatas acutas desinente; folia opposita, petiolo 4–8 mm. longo valido supra sulcato glabro; lamina oblongo-elliptica vel ovato-oblonga, 7–12 cm. longa, 3–5 cm. lata, longiacuminata, acumine angusto attenuato, basi abrupte contracta et acute decurrens, supra viridis, ad nervos sparse et minute puberula vel fere glabra, nervis prominulis, subtus pallidior, luteo-viridis, fere omnino glabra, costa gracili elevata, nervis lateralibus utroque latere c. 9, angulo acuto adscendentibus, gracilibus, prominentibus, arcuatis, in marginem desinente, nervulis prominulis arcte reticulatis; inflorescentia terminalis 4.5 cm. longe pedunculata, thyrsoideo-paniculata, c. 8 cm. longa et 5 cm. lata, basi trichotoma, pedunculo erecto sparse puberulo, ramis curvo-adscendentibus vel divaricatis minute puberulis, floribus dense congestis sessilibus, bracteis linearibus vel subulatis 3–6 mm. longis, filiformi-attenuatis, glabris; hypanthium 0.6 mm. longum glabrum obovoideum; calyx 0.5 mm. longus glaber 5-fidus, laciniis ovatis acutis; corolla ochroleuca, extus glabra, 4 mm. longa, tubo crasso basi paullo ampliato, superne sensim dilatato, ore 1.5 mm. lato, lobis oblongo-triangularibus obtusis 1.2 mm. longis patentibus; antherae semi-exsertae; stylus breviter exsertus.—Bolivia(?): Callcan, alt. 2,400 m., November, 1864, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.).

Palicourea fastigiata HBK. Nov. Gen. & Sp. 3: 368. 1820. *P. riparia* Benth. in Hook. Journ. Bot. 3: 224. 1841.

Near Cochabamba, *Bang 1243* (F, G, M, W). Río Palometillas, Dept. Santa Cruz, 400 m., *Steinbach 6752* (F). Widely distributed in tropical America.

A nearly glabrous shrub or small tree; stipules less than 5 mm. long, bifid, the lobes broad, obtuse or acute; leaves short-petiolate, thin, medium-sized, elliptic-oblong to ovate-oblong, acuminate, at the base usually acute, glabrous; inflorescence cymose-corymbose, pedunculate, dense, many-flowered, the branches ascending or erect, usually puberulent, the bracts minute; flowers slender-pedicellate; calyx lobes minute, ovate or rounded; corolla tubular, 8–10 mm. long, yellow, glabrous; fruit 4–5 mm. long, purple-black.

Palicourea flavifolia (Rusby), comb. nov. *Psychotria flavifolia* Rusby, Mem. Torrey Club 3^3: 48. 1893.

Yungas, *Bang 346* (F, G, M, type collection), *579* (F, G, B, M). Mapiri, 750 m., *Rusby 1871* (G, M, W). Without locality, *Bang 2861* (F, G, M, W). Sirupaya, in forests, 2,100 m., *Buchtien 572* (W). Milluguaya, North Yungas, 1,300 m., *Buchtien 764* (F, W). Polo-Polo, 1,100 m., *Buchtien 263* (F, G), *4737* (W); October, 1912, *Buchtien* (F, M).

A shrub 2–3 m. high, nearly glabrous; stipules about 5 mm. long, bilobate, the lobes triangular or lanceolate, obtuse or acute; leaves short-petiolate, oblong or oblong-lanceolate, thick, yellowish green when dried, 10–20 cm. long, acuminate, at the base acute; panicles long-pedunculate, thyrsiform, 7–14 cm. long, 5–7 cm. broad, rather dense, the branches spreading or ascending, minutely puberulent, the bracts minute; flowers pedicellate; calyx lobes very short, rounded; corolla orange, 10–14 mm. long, stout, minutely puberulent; fruit subglobose, 4 mm. long.

Palicourea glabrata Winkl. Repert. Sp. Nov. 8: 3. 1910.

San Antonio, near Mapiri, 850 m., *Buchtien 1609* (F, W, type collection; photo. of type, ex Herb. Berol., in F). Hacienda Simaco, 1,400 m., *Buchtien 5590* (B, W), *5586* (W). San Carlos, Mapiri region, 850 m., *Buchtien 1481* (F, B), *1482* (B, W).

A shrub 3–4 m. high, the branches glabrous; stipule sheath 3 mm. long, truncate, the lobes narrowly triangular, acuminate, 2 mm. long; leaves short-petiolate, thin, elliptic-oblong or ovate-oblong, the largest 11–23 cm. long and 4.5–8.5 cm. wide, long-acuminate, at the base acute, obscurely sericeous beneath along the nerves or glabrate; panicles sessile or pedunculate, broadly pyramidal, many-flowered, the branches spreading, glabrous or nearly so, the bracts minute; flowers long-pedicellate; calyx lobes minute, rounded, acute or apiculate; corolla glabrous, about 1 cm. long, orange-yellow or red.

Palicourea lasiantha Krause, Bot. Jahrb. Engler 40: 341. 1908. *Watsonamra sordidiflora* Rusby, Mem. N. Y. Bot. Gard. 7: 372. 1927.

Buenavista, Dept. Santa Cruz, 400 m., *Steinbach 7521* (F, B, K, M, S), *7358* (F, B, K, S). Chimate, Mapiri region, 500 m., *Buchtien*

1488 (F). San Buena Ventura, *Williams 663* (F, K). Rurrenabaque (San Buena Ventura), 300 m., in forest, *Cárdenas 1190* (Y, type of *Watsonamra sordidiflora;* photo. in F). Also in Peru.

A nearly glabrous shrub 3–3.5 m. high; stipules 4–7 mm. long, bifid, the lobes rounded; leaves short-petiolate, large, firm, oblong to elliptic, short-acuminate, at the base acute to rounded, glabrous or nearly so; panicles ovoid, large, pedunculate, open or dense, the branches spreading or ascending; flowers pedicellate; calyx lobes broadly ovate, acutish; corolla purple, 2 cm. long, densely lanate, the lobes very short; fruit subglobose, 5–6 mm. long.

The reference of this well-marked species of *Palicourea* to the genus *Pentagonia* (of which *Watsonamra* is a synonym) is difficult to understand, since the two groups are not similar in general appearance, and certainly not in structural details.

Palicourea macrobotrys (R. & P.) R. & S. Syst. Veg. 5: 194. 1819. *Psychotria macrobotrys* R. & P. Fl. Peruv. 2: 57. *pl. 203, f. a.* 1799. *Palicourea Williamsii* Rusby, Descr. N. Sp. S. Amer. Pl. 142. 1920.

Type of *P. Williamsii* from San Buena Ventura, at 420 m., *Williams 663*. Buenavista, Dept. Santa Cruz, in forest, 450 m., *Steinbach 7113* (F, M), *7481* (F, M), *5552* (F, B, Y). Río Juntas, 2,000 m., April, 1892, *Kuntze* (F, W). Cochabamba, *Bang 1204* (G, M, W). Mapiri, 750 m., *Rusby 1880* (W). Antahuacana, 750 m., *Buchtien 2286* (F, W). Rurrenabaque, 300 m., *Rusby 1578* (W). Buenavista, 500 m., *Steinbach 5233* (Y). San Carlos, Mapiri region, 600 m., *Buchtien 1456* (F). Ranging to Brazil and Colombia.

A shrub or small tree, sometimes 5 m. high, the slender terete branches pubescent or glabrous; stipule sheath 4 mm. long or less, truncate, the lobes subulate, about equaling the sheath; leaves short-petiolate, thin, oblong to lance-oblong or ovate-oblong, large, long-acuminate, at the base acute, usually finely pubescent beneath over the whole surface; inflorescence sessile or pedunculate, thyrsoid, very long and narrow, the branches short, the bracts linear, inconspicuous; flowers pedicellate; calyx lobes minute, ovate, acute; corolla yellow or reddish, about 1 cm. long, pubescent, tubular; fruit purple-black, 4–5 mm. long.

"Clavo rojo." Most of the Bolivian material has been referred to *P. nicotianaefolia* C. & S. (*Psychotria tabacifolia* Muell. Arg.), which probably is a synonym of *P. macrobotrys*.

Palicourea macrophylla (HBK.), comb. nov. *Nonatelia macrophylla* HBK. Nov. Gen. & Sp. 3: 423. 1820.

San Carlos, Mapiri region, 850 m., *Buchtien 1510* (B). Also in Peru, Venezuela, and British Guiana.

A shrub or tree, sometimes 8 m. high; stipules short, bilobate, the lobes obtuse; leaves petiolate, thin, large, elliptic to oblong-elliptic, acute or short-acuminate, mostly 20–30 cm. long, glabrous

above, minutely pubescent beneath; panicles large, long-pedunculate, thyrsoid or pyramidal, densely many-flowered; calyx lobes short, broadly ovate, obtuse or acute; corolla pale yellow, about 1 cm. long, densely puberulent-tomentulose; fruit of usually 5 pyrenes.

Palicourea malacophylla, sp. nov.—Ramuli graciles subteretes, densissime pilis brevibus patentibus vel subreflexis fulvis villosulo-tomentosi, internodiis elongatis; stipulae persistentes erectae lanceolato-oblongae, basi breviter connatae, dense villosulo-tomentosae, apice breviter bifidae, laciniis lanceolatis; folia opposita, petiolo crassiusculo 7–15 mm. longo densissime hispidulo-tomentoso; lamina coriacea, oblongo-ovata vel lanceolato-oblonga, 4.5–8 cm. longa, 1.8–3.5 cm. lata, acuminata, acumine triangulari acuto, basi rotundata vel obtusa, supra luteo-viridis, dense pilis brevibus patentibus lutescentibus molliter hispidulo-pilosula, nervis prominulis, subtus pallida, dense pilis patentibus gracilibus rigidis albidis hispidula, costa gracili elevata, nervis lateralibus utroque latere c. 9, angulo angusto adscendentibus, gracilibus, prominentibus, arcuatis, in marginem desinentibus, nervulis prominentibus laxe reticulatis; inflorescentia terminalis 3.5–5 cm. longe pedunculata, cymoso-corymbosa, dense multiflora, interdum congesta et capitiformis, 1–2 cm. longa, 2–3.5 cm. lata, basi trichotoma, pedunculo gracili dense hispidulo-piloso, ramis brevibus crassis rigidis patentibus vel angulo lato adscendentibus, dense hispidulis, floribus congestis sessilibus, bracteis subulatis inconspicuis usque ad 2 mm. longis dense pilosis; hypanthium obovoideum dense albido-pilosum 1–1.5 mm. longum; calyx 1.5–2 mm. longus, laciniis oblongis acutis dense breviterque pilosis; corolla extus densissime albido-hirsutula, 8 mm. longa, in alabastro apice rotundata, tubo crasso basi paullo ampliato, superne sensim dilatato, ore 2.5 mm. lato, lobis brevibus ovatis obtusis; antherae lineares semiexsertae.—Bolivia: Yungas, alt. 1,800 m., in 1885, *H. H. Rusby 2115* (Herb. N. Y. Bot. Gard., type; photo. in herb. Field Mus.).

A clearly defined species, well marked by the dense pale pubescence of all parts.

Palicourea mapirensis, sp. nov.—Frutex, ramulis gracilibus teretibus glabris laevibus in sicco ad nodos constrictis, internodiis valde elongatis; stipulae brevissime connatae erectae persistentes glabrae fere ad basin bifidae, lobis late oblongis apice late obtusis vel emarginatis; folia petiolata opposita, petiolo gracili 2–5 cm. longo; lamina membranacea late elliptico-oblonga, oblongo-ovata vel rarius oblongo-lanceolata, 19–38 cm. longa, 5.5–16.5 cm. lata, sensim acuminata vel interdum brevius abrupteque acuminata, basi acuta vel obtusa, rarius versus basin angustata, interdum abrupte contracta et breviter decurrens, glabra, supra viridis, costa venisque prominentibus vel prominulis, subtus fere concolor, costa gracili valde elevata, nervis lateralibus utroque latere c. 18 angulo lato adscendentibus vel subdivaricatis, gracilibus, prominentibus, fere rectis, prope marginem conjunctis, venulis inconspicuis laxe reticulatis; inflorescentia

terminalis thyrsoideo-paniculata ovoidea 7–14 cm. longe pedunculata, dense vel laxe multiflora, 8–14 cm. longa et 9–11 cm. lata, ramis crassiusculis subdivaricatis vel superioribus adscendentibus, minute puberulis vel glabratis, bracteis minutis deciduis, cymulis fastigiato-ramosis, pedicellis erectis validis plerumque 4–6 mm. longis minute puberulis; hypanthium turbinatum glabrum 1 mm. longum, calyce saepe disco breviore vix 1 mm. longo truncato vel obscure denticulato; corolla lutea tubulosa c. 8 mm. longa extus minute flavo-pulverulacea, tubo 2–2.5 mm. lato basi paullo incrassato, lobis brevibus; fructus globoso-ovoideus 4–5 mm. longus glaber, pyrenis 2 dorso obtuse 5-costatis.—Bolivia: San Carlos, Mapiri region, alt. 600 m., *Otto Buchtien 1508* (Herb. Field Mus. No. 609,023, type); at 850 m., December, 1926, *Buchtien 1509* (U. S. Nat. Herb.), *1510* (U. S. Nat. Herb.), *1507* (U. S. Nat. Herb.).

This plant is a member of a group in which too many species already have been described, but, if the others are recognized, this one also must be distinguished. From *P. guianensis* Aubl. it differs in its much smaller corolla; from *P. obliqua* Winkl., which it resembles closely in general appearance, it is distinguished by the very different pubescence investing the corolla.

Palicourea ovalifolia (Rusby), comb. nov. *Psychotria ovalifolia* Rusby, Bull. N. Y. Bot. Gard. 4: 371. 1907. *Palicourea obliqua* Winkl. Repert. Sp. Nov. 8: 4. 1910.

Without locality, *Bang 2014* in part (Y, type; photo. in F). Chuquini, 900 m., *Tate 1142* (Y). Charopampa, in forests, 570 m., *Buchtien 1629* (F, W, type collection of *P. obliqua*). Yungas, April, 1892, *Kuntze* (W, determination doubtful). San Carlos, Mapiri region, 850 m., *Buchtien 1505* (F, B).

A shrub or tree 2–8 m. high, the branches glabrous; stipules biparted, the lobes lanceolate, 6–10 mm. long, acuminate; leaves opposite, short-petiolate, thin, elliptic-oblong, often oblique, acuminate, at the base acute or obtuse, up to 27 cm. long and 10 cm. wide, sparsely pubescent beneath, especially on the nerves; panicles pedunculate, ovoid-pyramidal, 10–14 cm. long, dense, many-flowered, the branches spreading, hirtellous, the bracts subulate, inconspicuous; flowers pedicellate; calyx lobes ovate-triangular, acute; corolla densely tomentose, red, 10–12 mm. long, the lobes ovate, acute.

Palicourea papyracea Rusby, Bull. N. Y. Bot. Gard. 4: 370. 1907. *Psychotria rigida* var. *brevipes* Rusby, Mem. Torrey Club 6: 50. 1896.

Without locality, *Bang 2014* (W, type collection). Mapiri, 1,500 m., *Rusby 1864* (F, G, M, W). Tipuani to Guanai, *Bang 1667* (F, G, M, W, type collection of *P. rigida* var. *brevipes*). San Carlos, Mapiri region, 850 m., *Buchtien 1504* (B), *1514* (B, W), *1503* (B, W), *1513* (B, W), *1512* (B).

Branches glabrous; stipule sheath short and broad, loose, shallowly bilobate, the lobes rounded; leaves petiolate, ovate-oblong to

ovate-elliptic, long-acuminate, at the base acute to nearly rounded, firm, when young pilose beneath along the costa but soon glabrate; inflorescence cymose-corymbose, long-pedunculate, dense, many-flowered, the branches ascending, puberulent, the bracts minute; flowers on stout pedicels; calyx subtruncate, the lobes obscure; corolla about 2 cm. long, stout, furfuraceous-puberulent, the lobes short, obtuse; fruit 5 mm. long.

Rusby 1864 has been referred (Britton, Bull. Torrey Club 18: 109. 1891) to *Psychotria brachyloba* Muell. Arg.

Palicourea Pearcei, sp. nov.—Frutex 1–2-metralis, ramulis gracilibus glabris teretibus, internodiis 2–3.5 cm. longis; stipulae persistentes in vaginam truncatam glabram 1–1.5 mm. longam connatae, vagina in lacinias 4 oblongo-triangulares obtusas 1 mm. longas erectas desinente; folia opposita, petiolo crassiusculo 3–8 mm. longo glabro supra late sulcato; lamina oblonga vel lanceolato-oblonga, 6–11 cm. longa, 2–3.5 cm. lata, longiacuminata, acumine angusto attenuato obtuso, basi acuta et saepe inaequalis, utrinque glabra, supra viridis, nervis non elevatis, subtus pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 8, gracillimis, angulo lato adscendentibus, valde arcuatis, prominentibus, marginem attingentibus, nervulis obscuris arcte reticulatis; inflorescentia terminalis vel pseudoaxillaris 8 cm. longe pedunculata, late pyramidalis, c. 5 cm. longa et 5–6 cm. lata, laxissime pauciflora, pedunculo gracili glabro, ramis basalibus oppositis angulo recto divergentibus gracilibus glabris, floribus pedicellatis, pedicellis patentibus vel subreflexis glabris gracilibus 3–8 mm. longis, bracteis paucis subulatis 1–2 mm. longis inconspicuis glabris; hypanthium glabrum late cylindricum 1 mm. longum; calyx glaber 0.5 mm. longus, brevissime 5-lobus, lobis late ovatis obtusis; corolla lutea in alabastro obtusa, 6–7 mm. longa, glabra, basi subampliata, tubo intus supra basin densissime luteo-barbato, lobis brevibus late oblongis obtusis; antherae lineares 4 mm. longae; stylus glaber 6.5 mm. longus.—Bolivia: Moro, alt. 1,200–1,500 m., January, 1866, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.).

A species well marked by the form of the inflorescence, and not closely related to any other with which I am familiar. Of the flowers I have seen only the buds.

Palicourea punicea (R. & P.) DC. Prodr. 4: 526. 1830. *Psychotria punicea* R. & P. Fl. Peruv. 2: 62. *pl. 212, f. a.* 1799.

Charopampa, in forest, 570 m., *Buchtien 1624* (W), *1633* (W). Rurrenabaque, 300 m., *Rusby 784* (W, Y). Also in Peru.

A shrub 2–3 m. high, nearly glabrous; stipule sheath very short, truncate, bearing a short subulate lobe on each side; leaves opposite, short-petiolate, large, thin, ovate-elliptic to broadly elliptic, acuminate, at the base abruptly contracted and decurrent, when young sparsely puberulent beneath but soon glabrate; inflorescence pedun-

culate, cymose-corymbose, dense, the branches stout, ascending, puberulent, the bracts minute; calyx lobes short, rounded; corolla glabrous or nearly so, stout, 1 cm. long.

The identification of the Bolivian specimens is somewhat doubtful, but they agree fairly well with the Ruiz and Pavón illustration and description.

Palicourea radicans, sp. nov.—Suffrutex decumbens vel procumbens, caulibus e nodis radices emittentibus, simplicibus vel pauciramosis, ramis subteretibus fuscis laevibus glabris, internodiis elongatis; stipulae in vaginam brevissimam truncatam c. 1 mm. longam connatae, vagina in lobos 4 remotos lanceolatos acuminatos deciduous glabros ciliolatos desinente; folia opposita, petiolo gracili glabro 5–7 mm. longo; lamina oblongo-elliptica vel late obovato-elliptica, membranacea, 9–11 cm. longa, 3.5–6 cm. lata, acuminata, basi abrupte longiattenuata, glabra, supra obscure viridis, nervis prominentibus, subtus fusca, costa gracili elevata, nervis lateralibus utroque latere 9–10, gracilibus, prominentibus, angulo lato adscendentibus, arcuatis, prope marginem conjunctis; inflorescentia 4–7 cm. longe pedunculata fastigiato-cymosa, dense pauciflora, 3–4 cm. longa et lata, basi interdum trichotoma, ramulis erectis glabris; bracteae lanceolato-lineares attenuatae 1–6 mm. longae glabrae; flores conferti breviter pedicellati; hypanthium 1 mm. longum glabrum; calyx 1–1.5 mm. longus profunde 5-lobus, lobis ovato-oblongis obtusis vel acutis glabris; corolla tubuloso-infundibuliformis 8 mm. longa extus glabra, tubo basi paullo ampliato superne dilatato, fauce 2.5 mm. lato, lobis 1–1.5 mm. longis cucullato-apiculatis.—Bolivia: Río Tapacani, Dept. Santa Cruz, March 10, 1926, *José Steinbach 7507* (Herb. Field Mus. No. 573,387, type; duplicates in B and S), *7508* (F, B, K, S).

The species is noteworthy for its low habit, procumbent rooting stems, and small, fastigiately branched inflorescence.

Palicourea rigida HBK. Nov. Gen. & Sp. 3: 370. 1820.

Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 6680* (F, M), *5046* (F, Y). Tumapasa, *Williams 539* (W). Dept. Santa Cruz, *Steinbach 5014* (B). Widely distributed in South America.

A nearly glabrous shrub 1.5 m. high or often much less, the branches very stout and corky-thickened; stipule lobes short, acuminate; leaves subsessile, coriaceous, stiff, yellowish, elliptic to ovate or obovate, obtuse to short-acuminate, at the base rounded to acute; inflorescence pedunculate, rounded-ovoid, dense, many-flowered, minutely puberulent or glabrate, the branches purplish or green; calyx lobes nearly obsolete; corolla yellow, furfuraceous-puberulent, 12–14 mm. long; fruit black, 5–6 mm. long, glabrous.

Called "reina." Steinbach reports that the root is employed in local medicine as a powerful "blood-purifier."

Palicourea stipularis Benth. Pl. Hartw. 133. 1844. *Psychotria stipularis* Rusby, Mem. Torrey Club 3[3]: 47. 1893.

Yungas, *Bang 536* (B, G, M, W). Also in Ecuador.

A shrub or small tree, nearly glabrous; stipule sheath 4–6 mm. long, the lobes linear, distant, usually shorter than the sheath; leaves petiolate, elliptic-oblong or elliptic, 8–20 cm. long, short-acuminate, sparsely pilose beneath on the nerves; panicles thyrsoid, pedunculate, dense, many-flowered, equaling the leaves, the branches short, ascending or spreading, glabrous or puberulent, the bracts minute; flowers pedicellate; calyx lobes minute; corolla glabrous, 12–20 mm. long; fruit 5 mm. long.

The identification of the Bolivian collection is open to question.

Palicourea tenuis, sp. nov.—Ramuli gracillimi obtuse tetragoni, dense puberuli, in sicco fusci, internodiis brevibus; stipulae connatae persistentes ovatae 3–4 mm. longae glabrae, fere ad medium bifidae, laciniis lineari-lanceolatis attenuatis erectis; folia opposita, petiolo gracili 3–8 mm. longo puberulo; lamina parva, subcoriacea, lanceolato-oblonga vel anguste elliptico-oblonga, 3–3.8 cm. longa, 8–11 mm. lata, acuminata vel acuta, acumine obtuso, basi acuta, supra viridis, scaberula, nervis inconspicuis, subtus pallidior, ad nervos adpresso-pilosula, costa gracili elevata, nervis lateralibus utroque latere 6–7, gracilibus, prominulis, angulo lato adscendentibus, marginem attingentibus, nervulis manifestis laxe reticulatis; inflorescentia 2–3 cm. longe pedunculata fastigiato-cymosa, dense pauciflora, 1.5–2 cm. longa et lata, basi trichotoma, ramulis erectis puberulis; bracteae lineares attenuatae 5–10 mm. longae, sparse strigillosae vel glabratae; flores conferti sessiles vel brevissime pedicellati; hypanthium turbinatum glabrum 1–1.5 mm. longum; calyx profunde 5-lobus, laciniis linearibus 2–4 mm. longis inaequalibus attenuatis glabris; corolla infundibuliformis extus glabra 1.5 cm. longa, tubo basi vix ampliato, abrupte dilatato, fauce 5 mm. lato, lobis ovatis obtusis 2–2.5 mm. longis.—Bolivia: Unduavi, alt. 3,200 m., *Otto Buchtien 4390* (U. S. Nat. Herb., No. 1,175,954, type).

This plant, if it really is a *Palicourea*, represents a very well-marked species, noteworthy for the remarkably small leaves, small and slender-peduncled inflorescence, and large corolla.

Palicourea triphylla DC. Prodr. 4: 526. 1830. *Psychotria triphylla* Muell. Arg. in Mart. Fl. Bras. 6[5]: 233. *pl. 32.* 1881. *Palicourea mollis* Winkl. Repert. Sp. Nov. 8: 4. 1910. *Palicourea longipes* Rusby, Bull. N. Y. Bot. Gard. 8: 121. 1912. *Psychotria olyphylla* Rusby, Descr. N. Sp. S. Amer. Pl. 138. 1920.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7216* (F), *3093* (F), *7482* (F, M). San Antonio, near Mapiri, 850 m., *Buchtien 1612* (F, W, type collection of *P. mollis*). Hacienda Simaco, 1,400 m., *Buchtien 5597* (B, W). Tumapasa, *Williams 558* (Y, type of *P. longipes*, photo. in F; W); at 450 m., *Cárdenas 1977* (W, Y). San

Carlos, 750 m., *Buchtien 1506* (B, W); at 850 m., *Buchtien 1480* (B, W), *1479* (W). Ranging northward to Central America and Trinidad.

A shrub 2–3 m. high, the branches terete, glabrous; stipule lobes linear or lance-linear, 6 mm. long, ciliate; leaves ternate, short-petiolate, oblong or obovate-oblong, long-acuminate, at the base acute or obtuse, puberulent, especially beneath, or in age glabrate; inflorescence long-pedunculate, the panicles narrow-pyramidal, dense, many-flowered, densely short-pilose, the bracts lance-subulate; flowers pedicellate; calyx teeth obtuse; corolla yellow or reddish yellow, furfuraceous-puberulent, 12–15 mm. long.

The species is easily recognized by the ternate leaves. I have not seen *Rusby 2111* from Yungas, the type of *Psychotria olyphylla*, but *Williams 558*, which Rusby cites as belonging to the same species (although he had previously described it as *Palicourea longipes*), is *Palicourea triphylla*.

Palicourea verrucifera, sp. nov.—Frutex metralis, ramulis gracilibus teretibus viridibus sparse et minute puberulis, internodiis 2.5–3.5 cm. longis; stipulae virides persistentes 5–7 mm. longae, basi breviter connatae, sparse puberulae, apice breviter bifidae, laciniis linearibus acutis approximatis erectis; folia opposita, petiolo gracili 4–9 mm. longo puberulo; lamina crasse membranacea, elliptica vel oblongo-elliptica, 6–9 cm. longa, 2.5–3.5 cm. lata, acuminata, acumine angusto obtuso, basi acuta, supra viridis, minute scaberula vel ad costam prominentem breviter hispidula, nervis non elevatis, subtus pallidior, puberula, costa gracili elevata, nervis lateralibus utroque latere c. 8, angulo lato adscendentibus, gracilibus, prominentibus, arcuatis, in marginem desinentibus, nervulis vix prominulis arcte reticulatis; inflorescentia terminalis 2 cm. longe pedunculata cymoso-corymbosa, 4 cm. longa, dense multiflora, basi trichotoma, ramis gracilibus suberectis sparse puberulis pallidis, floribus plerumque pedicellatis, pedicellis usque ad 4 mm. longis puberulis, bracteis viridibus vel pallidis linearibus 2–4 mm. longis glabratis; hypanthium obovoideum 1 mm. longum sparse puberulum vel glabratum; calyx 2–2.5 mm. longus sparse puberulus vel glabratus, laciniis 5 oblongis obtusis erectis; corolla pallide lutea extus sparse puberula, in alabastro apice breviter et obtuse 5-corniculata, 9 mm. longa, tubo anguste cylindrico 2 mm. crasso, basi paullo ampliato, lobis ovalibus obtusis 1.5 mm. longis suberectis; stylus breviter exsertus.—Bolivia (?): Callcan, alt. 2,100–2,400 m., November, 1864, *Pearce* (Herb. Kew., type; photo. in herb. Field Mus.).

Similar to *P. cornifolia* Standl., but differing in the scaberulous upper leaf surface and in the much larger calyx.

50. RUDGEA Salisb.

Rudgea acuminata (R. & P.), comb. nov. *Coffea acuminata* R. & P. Fl. Peruv. 2: 64. *pl. 214, f. b.* 1799.

Beni River, *Rusby 2677* (G, Y). Also in Peru.

A glabrous shrub or small tree; leaves slender-petiolate, elliptic to oblong, 8–15 cm. long, caudate-acuminate, at the base acute, subcoriaceous; flowers subsessile, in small terminal few-flowered pedunculate panicles; fruit oval, 2 cm. long.

The determination of the Bolivian collection is very uncertain, but it agrees rather well with Ruiz and Pavón's illustration.

Rudgea amazonica Muell. Arg. Flora 59: 449. 1876.

Junction of the rivers Beni and Madre de Dios, *Rusby 1890* (F, G, W). Mapiri, 1,500 m., *Rusby 1891* (F, G, W); 750 m., *Rusby 1876* (G, K, W, Y). Yungas de San Mateo, Dept. Santa Cruz, 2,800 m., *Steinbach 8545* (F), *8541* (B, Y). Also in Brazil and Peru.

A glabrous shrub or small tree; stipules ovate, incised-laciniate; leaves petiolate, oblong to elliptic, acuminate, 10–17 cm. long, at the base acute, thick; flowers sessile, in terminal or axillary, pedunculate, many-flowered panicles shorter than the leaves; corolla 7–8 mm. long; fruit ellipsoid, 8–9 mm. long.

Rudgea Buchtienii, sp. nov.—Praeter inflorescentiam omnino glabra, ramulis crassis obtuse tetragonis vel subteretibus ad nodos incrassatis olivaceis, internodiis elongatis; stipulae persistentes 4–5 mm. longae triangulares vel ovatae plus minusve incrassatae obtusae, apice primo setulis paucis subulatis et incrassatis cito deciduis onustae; folia breviter petiolata opposita, petiolo crasso 5–12 mm. longo; lamina subcoriacea elliptico-oblonga usque ad late elliptica vel ovato-elliptica, 10–16 cm. longa, 3–9 cm. lata, abrupte et longiuscule acuminata, acumine angusto longe attenuato, basi obtusa vel subrotundata, interdum abrupte contracta et breviter decurrens, supra viridis, sublucida, costa plana, venis prominulis, subtus pallidior, in axillis costarum excavata, costa crassiuscula elevata, nervis lateralibus utroque latere c. 9 obliquis, angulo lato abeuntibus, gracilibus, prominentibus, valde arcuatis, juxta marginem conjunctis, nervulis prominulis arcte reticulatis; inflorescentia terminalis c. 3 cm. longe pedunculata thyrsoideo-paniculata dense multiflora, 3–4.5 cm. longa et 4–4.5 cm. lata, ramis infimis verticillatis basi bracteatis, superioribus quoque plerumque verticillatis, omnibus crassis patentibus vel late adscendentibus angulatis minute puberulis vel fere glabris apice trichotomis vel subumbellatis, bracteis minutis saepe deciduis, floribus dense congestis arcte sessilibus; hypanthium ut calyx glabrum late obovoideum c. 0.7 mm. longum, calyce virescente latissime campanulato saepe fere 2 mm. lato subtruncato vel remote breviterque denticulato hypanthio aequilongo; corolla extus glabra 3.5–4 mm. longa in alabastro apice obtusa, tubo brevi crassoque in fauce dense albo-barbato, lobis 5 anguste oblongis obtusis patentibus tubo aequilongis; antherae breviter exsertae oblongae; stylus breviter exsertus.—Bolivia: Sarampiuni, near San Carlos, region of Mapiri, alt. 500 m., April 4, 1927, *Otto Buchtien 1460* (Herb. Berol., type).

Rudgea ciliata (R. & P.) Spreng. Syst. Veg. 1: 755. 1825. *Coffea ciliata* R. & P. Fl. Peruv. 2: 65. *pl. 216, f. a.* 1799.

Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 7238* (F, B, K). Santa Cruz, 450 m., *Steinbach 7523* (F, B, K). Tumapasa, *Williams 564* (W). San Miguel, Mapiri region, 900 m., *Buchtien 1477* (B). Bosques de Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7314* (B). El Fraile, Dept. Santa Cruz, 450 m., *Steinbach 2860* (B). Also in Peru.

A glabrous shrub 3–4 m. high; stipules subulate, ciliate; leaves slender-petiolate, oblong to oval, 7–16 cm. long, acuminate, at the base acute, rather thin, paler beneath; flowers sessile or short-pedicellate, in small terminal panicles; calyx teeth 4–5, minute, subulate; corolla 7 mm. long, white, the throat villous, the lobes oblong, recurved, nearly equaling the tube; stamens exserted; fruit globose, red, 5–6 mm. broad.

Steinbach reports the vernacular name as "sauco del monte."

Rudgea fimbriata (Benth.) Standl. in Standl. & Calderón, Lista Pl. Salv. 274. 1925. *Psychotria fimbriata* Benth. in Hook. Journ. Bot. 3: 226. 1841. *R. micrantha* Muell. Arg. Flora 59: 454. 1876.

Junction of the rivers Beni and Madre de Dios, *Rusby 1874* (F, M, W). Ranging to the Guianas and Central America.

A glabrous shrub; stipules triangular-ovate, incised-laciniate; leaves subsessile, broadly elliptic to elliptic-oblong, 8–15 cm. long, acuminate, at the base obtuse; flowers sessile, cymose-paniculate, the panicles small, broad, many-flowered; calyx obscurely 5-dentate; corolla 5–7 mm. long, the lobes longer than the tube; fruit ellipsoid, 5–8 mm. long.

The collection cited was distributed as *Faramea montevidensis* DC.

Rudgea tomentosa Rusby, Mem. Torrey Club 3^3: 48. 1893. *Psychotria viburnifolia* Rusby, Mem. N. Y. Bot. Gard. 7: 378. 1927.

Yungas, *Bang 367* (F, G, M, W, type collection); alt. 1,200 m., *Rusby 1888* (F, G, W). Rurrenabaque, 300 m., *Cárdenas 1891* (Y, type of *P. viburnifolia;* photo. in F).

A shrub; stipules pectinate-laciniate; leaves short-petiolate, oblong to ovate or oblong-elliptic, 10–20 cm. long, short-acuminate, at the base acute, finely soft-pubescent beneath; flowers sessile, in small terminal pedunculate pubescent panicles; calyx teeth triangular, acute; corolla 7 mm. long, sparsely pilose, the lobes shorter than the tube.

Some of the specimens were distributed as *R. Hostmanniana* Benth.

Rudgea viburnoides (Cham.) Benth. Linnaea 23: 458. 1850. *Coffea viburnoides* Cham. Linnaea 9: 228. 1834.

Velasco, July, 1892, *Kuntze* (W). Also in Brazil.

A shrub 1.5–2.5 m. high; stipules rounded-triangular, acutish, aculeolate-ciliate; leaves short-petiolate, oblong-elliptic, 7–12 cm. long, 3–6 cm. wide, acute, at the base acutish, densely rough-tomentellous beneath; flowers in terminal pedunculate panicles, sessile; calyx lobes ovate, acuminate; corolla 10 mm. long, the 5 lobes twice as long as the tube; fruit ellipsoid, 9–12 mm. long.

In Brazil the plant is said to be employed as a remedy for syphilis.

51. PAEDERIA L.

Paederia diffusa (Britton), comb. nov. *Lygodisodea foetida* R. & P. Fl. Peruv. 2: 48. *pl. 188.* 1799, non *P. foetida* L. 1767. *Manettia diffusa* Britton, Bull. Torrey Club 18: 107. 1891. *Poederiopsis* (sic!) *diffusa* Rusby, Bull. N. Y. Bot. Gard. 4: 373. 1907.

Type from Guanai, at 600 m., *Rusby 2121*. Without locality, *Bang 2216* (F, W). Also in Peru.

A large, slender, ill-scented, suffrutescent, nearly glabrous vine; leaves long-petiolate, ovate, acuminate, usually cordate at the base; flowers in lax axillary panicles; calyx 5-lobed; corolla deep purple, 6–8 mm. long; fruit compressed, of 2 flat thin carpels 10–13 mm. long.

Although *Paederiopsis* is recognized as a distinct genus by Wernham, the characters supposed to distinguish it from *Paederia* prove to be inconstant, and it seems best to refer the plant to the genus *Paederia*, in which it was placed properly enough by its discoverers. It agrees very closely in general appearance and even in structural details with some of the well-known Old World species.

52. NERTERA Banks & Soland.

Nertera depressa Banks & Soland. ex Gaertn. Fruct. 1: 124. *pl. 26.* 1788.

Yungas, *Bang 700* (F). Cocopunco, 3,000 m., *Tate 380* (Y). Widely distributed in the mountains of South and Central America.

A slender creeping herb, often forming dense close mats over logs and open banks, the leaves small, the flowers minute, white; fruits fleshy, bright red.

When growing, the plant reminds one strongly of the partridge-berry (*Mitchella repens*) of the United States.

53. CORYNULA Hook. f.

Corynula pilosa (Benth.) Hook. f. in Hook. Icon. 12: 22. *pl. 1123.* 1876. *Mitchella pilosa* Benth. Pl. Hartw. 194. 1845.

On mossy banks in open forest, Incachaca–Chusi, Dept. Cochabamba, 2,300 m., *Steinbach 9154* (B). Also in the mountains of Peru and Ecuador.

A creeping herb, similar in appearance to *Nertera*, the stems pilose; leaves slender-petiolate, the blades ovate or rounded-ovate, 6–12 mm. long, acute or acutish, hispidulous beneath; flowers axillary, solitary, slender-pedicellate, 4–5-parted; calyx lobes linear; corolla 8 mm. long, narrowly funnelform, glabrous in the throat; stamens exserted.

54. MITRACARPUS Zucc.

Mitracarpus hirtus (L.) DC. Prodr. 4: 572. 1830. *Spermacoce hirta* L. Sp. Pl. ed. 2. 148. 1762. *M. simplex* Rusby, Mem. N. Y. Bot. Gard. 7: 381. 1927.

Without locality, *Bang 2865* (F, M, W). Without locality, *Mulford Expedition 1993A* (Y, type of *M. simplex;* photo. in F). Cochabamba, *Bang 945* (F, M, W). Moist places, Urubio, Dept. Santa Cruz, 450 m., *Steinbach 7122* (F, M). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 5098* (F, B, Y), *936* (B). Milluguaya, North Yungas, 1,300 m., *Buchtien 4392* (W), *4142* (W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3735* (W). Hacienda Simaco, 1,400 m., *Buchtien 5581* (W). Near Sorata, 2,600 m., *Mandon 340* (S), *339* (S). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7508* (F, B). Widely distributed in tropical America.

An erect, usually branched, pubescent annual; leaves lanceolate to oblong-ovate, acute; corolla white, not exceeding the calyx lobes.

Mitracarpus megapotamicus (Spreng.), comb. nov. *Spermacoce megapotamicus* Spreng. Syst. Veg. 4: Cur. Post. 40. 1827. *Mitracarpus Selloanus* C. & S. Linnaea 3: 361. 1828.

Cochabamba, March, 1892, *Kuntze* (W). Reported by Schumann (in Mart. Fl. Bras. 6^6: 81. 1888) from Bolivia, *Bridges 155, 156, 338*. Also in Brazil, Uruguay, and Argentina.

A perennial herb, the stems villous or tomentose; leaves linear-lanceolate or lance-oblong, scabrous; corolla longer than the calyx.

55. STAELIA C. & S.

Staelia filifolia Rusby, Mem. Torrey Club 4: 209. 1895.

Bolivian plateau, *Bang 937* (F, M, W, type collection). Quebrada Blanca, Misiones Guarayos–Santa Cruz de la Sierra, Dept. Santa Cruz, 250–300 m., *Werdermann 2605* (B). Sandy barrancas, Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6940* (F).

A low suffrutescent perennial; leaves linear, scaberulous; flowers white, sessile and densely clustered in the upper leaf axils.

56. RICHARDIA L.

Richardia brasiliensis Gómez, Mem. Ipecac. 31. *pl. 2.* 1802.

Yungas, 1,800 m., *Rusby 1969* (F). Without locality, *Bang 1794* (F, W). Cochabamba, *Bang 885* (F, W). Bolivian plateau, *Bang 944* (F, W). Sirupaya, South Yungas, 2,100 m., *Buchtien 558* (W). Widely distributed as a weed in South America.

A pilose or hispid, usually prostrate annual with oblong to elliptic, petioled leaves; flowers white, in dense terminal clusters; corolla 4–6 mm. long; fruit of 3 carpels, these keeled on the inner face.

Some of the Bolivian specimens have been referred to *R. scabra* L.

Richardia coldenioides Rusby, Mem. Torrey Club 4: 208. 1895.

Cochabamba, *Bang 949* (F, G, L, M, W, type collection). Lomas del Río Cuchi, Dept. Santa Cruz, 450 m., *Steinbach 7308* (F). La Paz, 4,100 m., *Buchtien 927* (W).

A low dense perennial, densely hispid; leaves lanceolate or linear-lanceolate, sessile, 0.5–2 cm. long; corolla 4 mm. long; carpels usually 3, hispidulous, smooth.

Richardia cruciata Rusby, Mem. Torrey Club 6: 51. 1896.

Mount Tunari, *Bang 1034* (F, W, type collection).

A small perennial, the stems 1–7 cm. long, hispid; leaves nearly sessile, elliptic-ovate, 1–1.5 cm. long; corolla 5–6 mm. long; carpels 4, smooth.

Richardia grandiflora (C. & S.) Steud. Nom. Bot. 459. 1840. *Richardsonia grandiflora* C. & S. Linnaea 3: 351. 1828.

Velasco, 200 m., *Kuntze* (F, W). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6987* (F). Also in Brazil.

A usually prostrate annual, hispid; leaves lanceolate or linear-lanceolate; flowers in dense bracted clusters; corolla lavender, 10–13 mm. long; carpels usually 3, densely tuberculate.

57. DIODIA L.

Diodia hyssopifolia (Willd.) C. & S. Linnaea 3: 350. 1828. *Spermacoce hyssopifolia* Willd. ex R. & S. Syst. Veg. 3: 532. 1819.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 961* (B). Ranging to Brazil and Colombia.

An erect perennial herb; leaves linear or linear-lanceolate, 2–6 cm. long, acuminate, plane, glabrous; flowers sessile in the leaf axils; fruit ellipsoid, puberulent at the apex or glabrate, nearly smooth.

Diodia Kuntzei Schum. in Mart. Fl. Bras. 6^6: 15. 1888.

Reyes, near water, 300 m., *Rusby 1338* (W). Also in Paraguay.

A small perennial herb; leaves linear-lanceolate, glabrous; setae of the stipules long-ciliate; flowers white, axillary; sepals 2.

Diodia rogaguana Rusby, Mem. N. Y. Bot. Gard. 7: 380. 1927.

Type from pampas near Lake Rogagua, *Rusby 1723A*. Buenavista, Dept. Santa Cruz, in wet fields, 500 m., *Steinbach 5110* (F, B).

Leaves lanceolate to oblanceolate, 1.5–2.5 cm. long, 5–12 mm. wide, obtuse or acutish, gray-hispid; flowers axillary, sessile, the clusters several- or many-flowered; corolla white.

58. HEMIDIODIA Schum.

Hemidiodia ocimifolia (Willd.) Schum. in Mart. Fl. Bras. 6^6: 29. 1888. *Spermacoce ocimifolia* Willd. ex R. & S. Syst. Veg. 3: 530. 1818.

In thin forest, Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5128* (F, Y). San Carlos, 750 m., *Buchtien 1639* (W). Hacienda Simaco, 1,400 m., *Buchtien 5584* (B, W). San Carlos, Mapiri region, 850 m., *Buchtien 1436* (W). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7510* (B, W). Widely distributed in tropical America.

A coarse perennial herb; leaves lanceolate, long-acuminate, long-attenuate at the base, puberulent or glabrate; flowers small, white, sessile, in dense axillary clusters.

59. EMMEORRHIZA Pohl

Emmeorrhiza umbellata (Spreng.) Schum. in Mart. Fl. Bras. 6^6: 408. 1889. *Borreria umbellata* Spreng. Neue Entd. 2: 144. 1821.

Without locality, 2,000 m., April, 1892, *Kuntze* (F). Guanai to Tipuani, *Bang 1467* (F). Extending to Brazil and Colombia.

A suffrutescent vine, densely pubescent to nearly glabrous; flowers small, white, in panicled umbels.

60. SPERMACOCE L.

Spermacoce glabra Michx. Fl. Bor. Amer. 1: 82. 1803.

Reported (Fries, Arkiv Bot. 6^{11}: 10. 1907) from Gran Chaco, Fortín Crevaux, *Fries 1644, 1649*. Widely distributed in tropical America.

Plants annual, glabrous; leaves lanceolate to elliptic; flowers very small, white, sessile and clustered in the leaf axils; fruit glabrous.

Spermacoce tenuior L. Sp. Pl. 102. 1753.

Yungas, *Bang 376* (F, M, W). Milluguaya, North Yungas, 1,300 m., along roadsides, *Buchtien 4071* (F, B). Cotaña, 2,450 m., *Buchtien 3269* (W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 4734* (W). Hacienda Anacuri, North Yungas, *Holway 724* (W). Near Sorata, 2,600 m., *Mandon 336* (S, B, Y). Widely distributed in tropical America.

An erect, nearly glabrous annual with lanceolate leaves and small white axillary flowers; fruit pubescent.

61. BORRERIA Mey.

Borreria Brownii (Rusby), comb. nov. *Spermacoce Brownii* Rusby, Mem. Torrey Club 4: 208. 1895. *B. staurochlamys* R. E. Fries, Arkiv Bot. 6^{11}: 9. *pl. 2*. 1907.

Yungas, *Bang 473* (F, G, M, type collection). Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6983* (F, M). Sirupaya, South Yungas,

1,900 m., *Buchtien 559* (W). Polo-Polo, North Yungas, 1,100 m., *Buchtien 3919* (W). Type of *B. staurochlamys* from Gran Chaco, Tatarenda, *Fries 1387*.

An erect annual; leaves lance-oblong, acuminate, pilose beneath; flowers white, in dense terminal clusters; calyx lobes ovate or oval, obtuse, densely ciliate.

Borreria capitata (R. & P.) DC. Prodr. 4: 545. 1830. *Spermacoce capitata* R. & P. Fl. Peruv. 1: 61. *pl. 91, f. b.* 1798. *S. ferruginea* St. Hil. Pl. Us. Brés. *pl. 13*. 1824. *B. ferruginea* DC. Prodr. 4: 547. 1830. *B. nectarifera* Rusby, Mem. N. Y. Bot. Gard. 7: 381. 1927.

Without locality, *Bridges* (K). Polo-Polo, North Yungas, 1,100 m., *Buchtien 218* (F); October, 1912, *Buchtien* (M). Guanai, 600 m., *Rusby 1401* (B, M). Sirupaya, South Yungas, 2,200 m., *Buchtien 549* (W). Yungas, *Bang 397* (F, M). Guanai to Tipuani, *Bang 1341* (F, M). Pampas near Lake Rogagua, 300 m., growing in water, *Rusby 1659* (Y, type of *B. nectarifera*). Widely distributed in South America.

An erect perennial herb, densely pubescent; leaves linear to lanceolate, sessile or nearly so; flowers white, in dense, terminal and axillary heads; calyx lobes 4; fruit puberulent at the apex.

In Brazil, where this species is called "poaya" and "poaya do campo," it is reported to be used like ipecac.

Borreria corymbosa (R. & P.) DC. Prodr. 4: 550. 1830. *Spermacoce corymbosa* R. & P. Fl. Peruv. 1: 60. *pl. 91, f. a.* 1798.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 7034* (F, M), *5063* (F, Y). Milluguaya, North Yungas, 1,300 m., *Buchtien 765* (F, W). Santa Cruz, 340–400 m., June, 1892, *Kuntze* (W). Reyes, 450 m., *Rusby 2107* (W, B).

Plants woody or suffrutescent, glabrous; leaves linear to lanceolate; inflorescence corymbose; corolla white, glabrous outside.

Borreria densiflora DC., var. **perennis**, var. nov.—Herba perennis multicaulis, caulibus e radice lignosa erectis simplicibus vel versus apicem pauciramosis; ceteris formae typicae omnino similis.—Bolivia: Villamontes, in 1923, *K. Pflanz 2077* (U. S. Nat. Herb. 1,234,336, type).

The typical form of the species is a branched annual herb with a long taproot.

Borreria eryngioides C. & S. Linnaea 3: 316. 1828.

Reported (Fries, Arkiv Bot. 6^{11}: 9. 1907) from Tatarendà, Chaco, *Fries 1369*. Also in Brazil, Uruguay, and Argentina.

Plants annual or perennial, the older stems glabrous, white-striate along the angles; leaves oval to lanceolate or almost linear, 1.5–3 cm. long, glabrous, retrorse-scabrous on the margins; inflorescences terminal and capitate and also axillary and unilateral; calyx

lobes triangular, acute or acuminate; hypanthium pilose above; corolla 1–1.5 mm. long, the lobes twice as long as the tube; fruit 2.5 mm. long.

This species is closely related to *B. ocimoides*, and it may well be that the Bolivian material belongs rather to that species.

Borreria exigua S. Moore, Med. Rijks Herb. 46: 26. 1922.

Type from Cuesta de los Monos, *Herzog 1896a*.

Plant 5 cm. high, branched from the base; leaves linear, 3–4 mm. long, glabrous; flowers in dense, axillary and terminal heads; calyx lobes 2, subulate; corolla 5 mm. long.

Borreria Herzogii S. Moore, Med. Rijks Herb. 46: 26. 1922.

Type from Tres Cruces, alt. 1,500 m., *Herzog 1572*.

Stems erect, pubescent; leaves linear-lanceolate, 1-nerved, scaberulous; flowers in dense axillary clusters; calyx lobes 2; corolla short-hispidulous outside, 5 mm. long; stigma bilobate.

Borreria laevis (Lam.) Griseb. Goett. Abh. 7: 231. 1857. *Spermacoce laevis* Lam. Ill. 1: 273. 1791.

Polo-Polo, North Yungas, 1,100 m., *Buchtien 217* (F), *5765* (W); October, 1912, *Buchtien* (M). Charopampa, 570 m., *Buchtien 1637* (W). Antahuacana, 750 m., *Buchtien 2289* (F, W). Milluguaya, North Yungas, 1,300 m., *Buchtien 4727* (W). Mapiri, 600 m., *Rusby 1857* (M). Widely distributed in tropical America.

An annual; leaves oblong-lanceolate to ovate, more or less pilose beneath; flowers in dense, terminal and axillary clusters; calyx lobes 4, triangular, acute, glabrate.

Borreria latifolia (Aubl.) Schum. in Mart. Fl. Bras. 6^6: 61. 1888. *Spermacoce latifolia* Aubl. Pl. Guian. 55. *pl. 19, f. 1.* 1775.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 958* (B). Charopampa, Mapiri, along roadsides, 570 m., *Buchtien 1634* (F). Yungas, *Bang 376* (F). Mapiri, 1,500 m., *Rusby 1938* (W), *1942* (W). Hacienda Simaco, 1,400 m., *Buchtien 5582* (W). Milluguaya, North Yungas, 1,300 m., *Buchtien 4430* (B, W). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7509* (F, B). San Carlos, region of Mapiri, 850 m., *Buchtien 1401* (B). Widely distributed in tropical America.

An annual or perennial herb, yellowish green when dried, the stems narrowly winged above, nearly glabrous; leaves broadly elliptic, acute, conspicuously nerved; flowers white, in dense axillary clusters.

Borreria ocimoides (Burm.) DC. Prodr. 4: 544. 1830. *Spermacoce ocimoides* Burm. Fl. Ind. 34. *pl. 13, f. 1.* 1768. *S. cephalophora* Rusby, Bull. N. Y. Bot. Gard. 4: 374. 1907.

Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6972* (F). San Carlos, Mapiri, 750 m., *Buchtien 1635* (F). Charopampa, 570 m., *Buchtien 1638* (F, W, Y). San Carlos, 750 m., *Buchtien 1636* (W). Antahuacana, 750 m., *Buchtien 2290* (W). Hacienda Simaco, 1,400

m., *Buchtien 5583* (W). Without locality, *Bang 2862* (W, type collection of *S. cephalophora*). Mapiri, 1,500 m., *Rusby 1939* (W). San Carlos, Mapiri region, 850 m., *Buchtien 1414* (B, W), *1415* (B, W), *1434* (B). Río Chaparé–Mamoré, Dept. El Beni, 250 m., *Werdermann 2196* (B). Polo-Polo, near Coroico, North Yungas, 1,100 m., *Buchtien 4100* (B). Charopampa, near Mapiri, 570 m., *Buchtien 1640* (B). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 925* (B). Generally distributed as a weed in tropical America, and in Africa and Asia.

A slender, branched, nearly or quite glabrous annual; flowers white, densely clustered in the leaf axils, the clusters very small.

Borreria suaveolens Mey. Prim. Fl. Esseq. 81. *pl. 1.* 1818. *Spermacoce tenella* HBK. Nov. Gen. & Sp. 3: 345. 1819. *B. tenella* C. & S. Linnaea 3: 317. 1828.

Velasco, 200 m., July, 1892, *Kuntze* (F). Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5070* (F, B, Y), *5063* (B), *6966* (F). Temperate region at 2,500 m., *Mandon 338* (G, S, Y). Tierra negra, Buenavista, 450 m., *Steinbach 959* (B). Incachaca, Dept. Cochabamba, 2,300 m., *Steinbach 9473* (B). Widely distributed in tropical America.

A nearly glabrous, usually erect perennial, often suffrutescent; leaves linear or lanceolate; flowers white, in dense, chiefly terminal heads; calyx lobes 4.

62. RELBUNIUM Hook. f.

Relbunium alpicola Schum. & Fries, Nova Act. Soc. Sci. Upsala IV. 1^1: 191. 1905.

Type from Cuesta de Zama, near Tarija, alt. 4,000–4,500 m., growing in clefts of rocks, *Fries 1018*.

Plants 5 cm. high, the stems hirtellous; leaves lanceolate, acutish, rigid, glabrous but long-ciliate; peduncles shorter than the leaves; ovary very finely puberulent.

Relbunium ciliatum (R. & P.) Hemsl. Biol. Centr. Amer. Bot. 2: 62. 1881. *Galium ciliatum* R. & P. Fl. Peruv. 1: 59. 1798. *R. compactum* Rusby, Mem. Torrey Club 3^3: 49. 1893.

Talca Chugiaguillo, *Bang 801* (F). Without locality, *Bang 2019* (F, G, W), *2020* (F, M, W). La Paz, 3,800 m., March, 1913, *Buchtien* (F, M, W); *Pennell 14224* (F); *Buchtien 539* (F). Isla de la Lima, Lake Titicaca, 3,840 m., *Buchtien 2994* (F, W). La Paz, 3,000 m., *Bang 35* (M, W); *Rusby 1837* (W); *Buchtien 3993* (W), *4730* (W), *3994* (W), *52* (W); *Claude-Joseph 1119* (W). Oruro, 3,900 m., *Asplund 5760* (W), *5761* (W). Without locality, *Bang 2864* in part (M). La Merced bei Bermejo, 1,700 m., *Fiebrig 3387* (B). Southern side of Tunari, Dept. Cochabamba, 3,500 m., *Steinbach 9774* in part (B). Ranging northward to Colombia.

Plants low, the stems glabrous; leaves linear to lance-oblong, acute, glabrous, usually ciliate; fruit glabrous.

Some of the Bolivian specimens have been referred to *R. pusillum* (Endl.) Schum. and *R. microphyllum* (Gray) Hemsl. *R. compactum* is a form with eciliate leaves. This form ranges as widely as typical *R. ciliatum*, and it is perhaps worthy of varietal rank, although every gradation between the two forms may be found.

Relbunium croceum (R. & P.) Schum. in Mart. Fl. Bras. 6[6]: 116. 1888. *Galium croceum* R. & P. Fl. Peruv. 1: 59. 1798.

La Paz, 3,750 m., *Buchtien 539* (F). Base of Mount Ilimani, 2,360 m., *Julio 107* (W). Also in Peru.

Plants usually low, the stems scaberulous or puberulent; leaves linear or lanceolate, acute, ciliate, glabrous above, hirtellous beneath; pedicels equaling or shorter than the leaves; fruit red, glabrous.

Relbunium diffusum (Pohl) Schum. in Mart. Fl. Bras. 6[6]: 111. 1888. *Rubia diffusa* Pohl ex DC. Prodr. 4: 592. 1830. *Relbunium Bangii* Rusby, Bull. N. Y. Bot. Gard. 4: 374. 1907.

Yungas, *Bang 518* (F, M, W), *269* (F, W). Coripati, Yungas, *Bang 2154* (F, type collection of *R. Bangii*). Polo-Polo, North Yungas, 1,100 m., *Buchtien 281* (F); October, 1912, *Buchtien* (F, M). Sirupaya, South Yungas, 2,100 m., *Buchtien 147* (F), *253* (W), *252* (W). Milluguaya, North Yungas, 1,300 m., *Buchtien 766* (F). Polo-Polo, North Yungas, 1,100 m., *Buchtien 4728* (W). Locality uncertain, *Williams 276* (W). Mapiri, 1,500 m., *Rusby 1830* (M). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7511* (F). Also in Peru and Brazil.

A large much-branched herb, the stems retrorse-hispidulous; leaves mostly oval, obtuse or apiculate, 3-nerved, pilose and hispidulous; fruit glabrous, white.

Some of the specimens have been distributed as *R. mucronatum* (R. & P.) H. & A. and *R. vaillantioides* (C. & S.) Schum.

Relbunium hirsutum (R. & P.) Schum. in Mart. Fl. Bras. 6[6]: 118. 1888. *Galium hirsutum* R. & P. Fl. Peruv. 1: 59. 1798.

Without locality, *Bang 2864* (F, M in part); *Mandon 126* (L), *328* (L). Unduavi, North Yungas, 3,200 m., *Buchtien 670* (F), *3000* (F, W), *3001* (F, W), *2996* (W), *2998* (W). Talca Chugiaguillo, *Bang 801* in part (M). Unduavi, *Rusby 1838* (W). Sorata, 3,000 m., *Rusby 1826* (M, W); at 2,600 m., *Mandon 326* (S). South side of Tunari, Dept. Cochabamba, 3,500 m., *Steinbach 9774* in part (B). Toldos bei Bermejo, 2,100 m., on rocks, *Fiebrig 3381* (B). Southern Bolivia, *Fiebrig 3378* (B). Altos de La Paz, 4,000 m., *Seler 129* (B). Ranging northward to Colombia.

Plants usually low, the stems short-hirsute; leaves lanceolate to oblong-ovate, acute, short-hirsute; fruit glabrous.

Relbunium hypocarpium (L.) Hemsl. Biol. Centr. Amer. Bot. 2: 63. 1881. *Vaillantia hypocarpia* L. Syst. Nat. ed. 10. 1307. 1759.

Milluguaya, North Yungas, 1,800 m., *Buchtien 4101* (F). Hacienda Simaco, 1,400 m., *Buchtien 5600* (B, W). Isla del Sal, Yumani, 3,850 m., *Buchtien 5762* (W). Coripati, Yungas, *Bang 2154* in part (M). Yungas, *Bang 269* in part (M). Sorata, 2,600 m., *Mandon 327* (L, S, Y). Incachaca, Cochabamba, 3,000 m., *Steinbach 5007* (Y). Hacienda Casana, Tipuani Valley, *Buchtien 7512* (B, F), *7513* (F). La Aduana, Dept. Cochabamba, 3,200 m., *Steinbach 9582* (B, Y). Widely distributed in the mountains of tropical America.

A much-branched herb, often scandent; leaves mostly oval, hirtellous or pilose on both surfaces; fruit orange-red, pilose.

Relbunium nitidum (HBK.) Schum. in Mart. Fl. Bras. 6^6: 114. 1888. *Rubia nitida* HBK. Nov. Gen. & Sp. 3: 339. *pl. 280.* 1819.

San Mateo, Dept. Santa Cruz, 3,300 m., *Steinbach 8448* (B). Near La Paz, 3,000 m., *Rusby 1834* (Y). La Aduana, Dept. Cochabamba, 3,000 m., *Steinbach 9536* (B, Y). Also in Ecuador and Colombia.

Slender, much branched, procumbent or sometimes subscandent, the stems reflexed-pilose or glabrate; leaves elliptic or obovate, acute or obtuse, usually coriaceous, glabrous above, ciliate, beneath usually hispidulous; fruit fleshy, glabrous, orange or red.

Relbunium tenuissimum Krause, Bot. Jahrb. Engler 40: 350. 1908.

Type collected near Tarija, *Fiebrig 3384* (photo. of type, ex Herb. Berol., in F).

Stems slender, elongate, glabrous; leaves linear-lanceolate, mucronulate, glabrous; fruit glabrous.

Probably this is not distinguishable from *R. ciliatum.*

Relbunium vile (C. & S.) Schum. in Mart. Fl. Bras. 6^6: 116. 1888. *Rubia vilis* C. & S. Linnaea 3: 230. 1828.

Reported (Fries, Arkiv Bot. 6^{11}: 11. 1907) from Tolomosa near Tarija, *Fries 1109.* Also in Brazil, Uruguay, and Argentina.

A perennial herb, the stems short or elongate, weak, often scandent, retrorse-scabrous on the angles; leaves lanceolate to suboval, 8–15 mm. long, obtuse and short-acuminate, glabrous, aculeolate-serrulate; peduncles often 3-flowered; ovary glabrous, fruit 1 mm. long and 1.5 mm. wide.

63. GALIUM L.

Galium Aparine L. Sp. Pl. 108. 1753.

Unduavi, North Yungas, 3,300 m., *Buchtien 3003* (F, W). Titicaca, 3,840 m., *Buchtien 4731* (W). La Paz, 3,800 m., *Buchtien 4444* (W). Sorata, 2,600 m., *Mandon 331* (S), *335* (S, Y). Reported from Unduavi (*Rusby 1829*) and Ingenio del Oro at 3,000 m. (*Rusby 1919*) by Britton (Bull. Torrey Club 18: 262. 1891). Widely distributed in temperate and subtropical regions of both hemispheres.

Plants annual, retrorsely scabrous; leaves mostly in 6's, linear or oblanceolate-linear, cuspidate; fruit uncinate-hispid.

Galium larecajense Wernham, Journ. Bot. 50: 244. 1912.

Type collected between Munaypata and Río Challasuyo, near Sorata, Prov. Larecaja, alt. 2,600–2,700 m., *Mandon 339*.

Stems sparsely uncinulate; leaves 1-nerved, lanceolate, acuminate, the margins and costa uncinulate; fruit uncinate-hispid, usually solitary.

Galium Mandoni Britton, Bull. Torrey Club 18: 263. 1891.

Sorata, 3,000 m., *Rusby 1831* (M, W, type collection). Unduavi, 2,400 m., *Rusby 1839* (W). Cotaña, 2,450 m., *Buchtien 3270* (F, W). La Paz, 3,800 m., *Buchtien 4445* (W); at 3,700 m., *Pflanz 51* (B). Sorata, *Mandon 334* (L, S). Britton reports also *Mandon 333*.

Stems retrorse-scabrous on the angles; leaves in 4's, linear-oblong, acute, 5–10 mm. long, retrorse-scabrous on the margins and costa; peduncles axillary, 1-flowered, puberulent; fruit glabrous, fleshy.

Galium obovatum HBK. Nov. Gen. & Sp. 3: 336. *pl. 277*. 1819.

Sorata, 2,400 m., *Rusby 1832* (M, W). Unduavi, North Yungas, 3,200 m., *Buchtien 3004* (F, W). Tunari, May, 1892, *Kuntze* (W). Edge of forest, Incachaca, Dept. Cochabamba, 2,300 m., *Steinbach 9450* (B). Incachaca–Chusi, Dept. Cochabamba, 2,300 m., *Steinbach 9155* (B). Ranging to Colombia.

Stems slender, elongate, pilose or glabrate; leaves in 4's, obovate, 3-nerved, rounded at the apex and apiculate, sparsely pilose or glabrate; fruit dry, densely uncinate-hispid.

Galium plumosum Rusby, Mem. Torrey Club 3^3: 49. 1893. *G. cochabambense* Rusby, Mem. Torrey Club 6: 52. 1896.

Cochabamba, *Bang 760* (M, B, W, type collection of *G. plumosum*); *Bang 1145* (M, W, type collection of *G. cochabambense*); March 26, 1892, *Kuntze* (W); *Holway 390* (W). Palca–La Paz, 3,650 m., *Pflanz 452* (B).

Stems retrorse-hispid; leaves 5–9 mm. long, oblong or linear-oblong, acutish, 1-nerved or obscurely 3-nerved, retrorse-hispidulous on the margins; peduncles 2–3-flowered; fruit densely white-hairy, the hairs long and straight.

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